Technical COMMUNICATION

MEASURES OF PRODUCTIVITY AND EFFECTIVENESS FOR TECHNICAL COMMUNICATORS

- **FORUM MODERATION AS TECHNICAL COMMUNICATION**

- **IFIXIT AND THE SOCIAL IMPACT OF KNOWLEDGE WORK**

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Menno D.T. de Jong, Editor

The Quest for a Usability Theory

When it comes to the use of the term theory, technical communication is one of the modest academic disciplines. Researchers in our field conduct solid and relevant studies, with clear practical implications and the potential to contribute to a framework of academic and practical knowledge, but seldom frame their efforts in terms of theoretical contributions. I am not referring to research that is merely called theoretical because of a lack of practical implications. I am referring to theory as a generalized and widely used body of knowledge, which is built on and verified by empirical research, and which can help to predict and explain events in real life.

Having a set of well-established theories has several clear advantages for a discipline. For instance, it is easier to find communalities in different studies. Theories lead to convergence in research and to more focused discussions. Convergence, in turn, leads to more systematic referrals to earlier research contributions, which, according to the metrics that are used in the current academic publication culture, result in higher impact scores of researchers and journals. Theories also provide a basis to make sense of and find support for the findings of specific applied studies. Of course, it also works the other way around: the results of applied studies may also inspire the modification or extension of theories. And finally, in the case of academic research application processes, having established theories in a proposal significantly enhances the chances of success. And wouldn't that be something we all want: more funded research to further the discipline of technical communication?

Usability and Theory

The development of the concept of usability may be a good example of this phenomenon. Academics and practitioners have conducted research into the usability of devices and software for decades now, but there is still not a generally accepted usability theory available, even though the tacit knowledge about usability might add up to such a theory. To verify or falsify this claim, I conducted a small literature search looking for articles combining usability and theory in the title. I found several references, most of them focusing on the usability of certain theories or of the usability of devices designed according to certain theories. One reference actually talked about usability theory, but this theory appeared to be the practice and methodology of usability engineering and usability testing. With all due respect, that is not a theory. It does not predict or explain anything, but merely prescribes a way of working, and provides the methodology to do so.

Three Theoretical Angles

The concept of usability is presumably too broad for just one theory. Several directions may be chosen. A first direction could focus on determinants of usability. Determinants may be generalized product characteristics, such as simplicity, consistency, and intuitiveness. They may also be more specific product characteristics, like the ones that are contained in heuristics. Or they may focus on the relationship between the product and its users, like the mental model hypothesis, which assumes that a good fit between a product and the users' mental model of the product will reduce errors. A good way to work toward a theory on this aspect of usability would be a line of research that systematically seeks to analyze and explain why certain products are more usable than others.

A second direction could focus on the consequences of usability. As a matter of fact, there are already some theories available in which usability is included as one of the determinants. Most notably, the Technology Acceptance Model and its successor, the Unified Theory of Acceptance and Use of Technology (UTAUT), include perceived usability as a predictor of people's intentions to use certain devices. The relationship between perceived and actual usability is not addressed in this context. Both theories do not seem to be influential within

the technical communication domain, although users' acceptance of technology will also be one of the concerns of a technical communicator. However, both theories are rather limited regarding the potential consequences of usability, which may be more diverse and far-reaching. More interesting are the relationships of usability with overall user experience and appreciation of products, with the overall reputation of the brand or the product, and with people's underuse of functionality and, as a result, with the perceived usefulness of the device. Research that is designed from this theoretical angle will contribute to the value-added discussion in the technical communication literature.

A third direction could focus on the question why usability is almost always problematic in the design process of new devices or new versions of old devices. For instance, why do designers or engineers often choose to radically change everything between versions? Why do they invent functions that hardly anyone will ever use or even discover? And what causes them to develop interfaces that are hard to explain, let alone work with and memorize? Various factors may be addressed: the predispositions and competencies of designers, engineers, and/or technical communicators, the dynamics during the design process, the use of research in the design process (for instance, needs assessment, task analysis, and usability testing), and the characteristics of the organization (for instance, the organization's mission). Many of

these factors have already been addressed in research, but an overall framework, with attention to the way the factors interact with each other, is lacking. This theoretical direction is a little less pre-structured and a little more exploratory than the first two directions, but it will surely pay off if we gain a better understanding of characteristics that lead to adequate or questionable usability.

Special Issue on Theories in Technical Communication

Of course, these were just examples focusing on one specific topic within our discipline (although certainly not the least important topic). Comprehensive theoretical attention to the way users incorporate instructions while working with software or devices would be another relevant area. In the May issue of 2015, which demarcates the end of my second term as the editor of *Technical Communication*, I hope to present a special issue devoted to the development of theories in technical communication.

In This Issue

The three articles in this issue address very diverse topics. In the first article, Saul Carliner, Adnan Qayyum, and Juan Carlos Sanchez-Lozano present the results of a survey among technical communication managers about the extent to which they measure their productivity and the effectiveness of their work. By doing so, they confront the prescriptions in the technical communication textbooks with the technical communication

practice. They conclude that the measures proposed in the literature are not widely used in practice, and that perceptions are the most significant way of assessing the value of technical communication products and services in organizations.

The second article is written by Jordan Frith. He examines online help forums as a form of technical communication. On the basis of interviews with forum moderators, he identifies five different roles of moderators and concludes that the competencies required for a good forum moderator match those of a technical communicator. As such, his article expands the possible job market for professionals with a technical communication background.

The third and last article in this issue, by Guiseppe Getto, Nathan Franklin, and Sheryl Ruszkiewicz, describes a combined teaching/research project, in the context of iFixit's Technical Writing Project. In a qualitative case study, they examined the interactions of technical writers, technical writing students, technological devices, tools, and wiki technologies. Based on their findings, the authors reflect on the reciprocal influence of human and non-human agents, and on the role of students as knowledge workers.

What Measures of Productivity and Effectiveness Do Technical Communication Managers Track and Report?

Saul Carliner, Adnan Qayyum, and Juan Carlos Sanchez-Lozano

Abstract

Purpose: Previous literature focuses on what practitioners should be doing to demonstrate the value of technical communication, rather than what they actually do. This study addresses the gap by asking managers about the extent to which they track two measures of value—productivity and effectiveness—as well as the expectations of sponsors for receiving reports on these issues.

Method: A survey of corporate communication, training, and technical communication groups was conducted. Participants were recruited through local chapters of the STC and the American Medical Writers Association. Ninety technical communication managers responded.

Results: The evidence suggests that activities for tracking productivity by technical communication managers are limited. Technical communication groups rarely solicit feedback and perceptions on individual communication products and employ usability testing on a limited basis. Technical communicators rarely track return on investment (ROI). Technical communication managers feel limited pressure to report productivity and effectiveness. The most significant criteria against which the productivity and effectiveness of technical communication groups is assessed is word of mouth. The evidence only partially supports this entering belief: Customer surveys play an important role in assessing general impressions of technical communication products.

Conclusions: These results are consistent with earlier studies and suggest that despite a discussion about means of assessing the productivity and effectiveness of technical communicators that has spanned over a quarter of a century, none of the methods of assessment has reached wide use. The study also suggests that perceptions are the most significant factor in assessing the value of technical communication products and services, and should be given more focus in future research and writing on this topic.

Keywords: assessment, effectiveness, management, metrics, productivity

Practitioner's Takeaway

- When assessing how others in your organization perceive the value of the technical communication services provided by your group, primarily focus on the word-of-mouth flowing through the organization and the quality of the service provided.

- When looking for quantitative measures of productivity and effectiveness, recognize that none of the methods proposed have achieved wide use and most require extensive resources that might be better used for other purposes.

Measures of Productivity and Effectiveness

Background

One of the recurring conversations among technical communicators focuses on demonstrating the value of our services to the people who sponsor them. (*Sponsors* are the people who authorize funding for technical communication services—and can stop payment on approved projects.) The issue received wide recognition with the publication of a special issue of *Technical Communication* on "Adding Value as a Professional Technical Communicator" (Redish, 1995), which described an approach for determining the value added by technical communicators based on the goals of a given project and reports on several cases that adapted the approach (such as Blackwell, 1995; Daniel, 1995; Spencer, 1995). Later publications have continued to report cases that replicate this methodology (such as Downing, 2007; Fisher, 1999; Henry, 1998).

The issue has continued to receive attention in both the scholarly and professional literature. For example, at the beginning of the recession of 2008–2009, *Intercom*, the magazine of STC, published a special issue with advice to individual technical communicators on how to demonstrate their value to their employers and clients. In an effort to actively promote the profession, STC explains "How Technical Writers Add Value to Your Team" on its website (STC, n.d.).

But this body of literature primarily suggests what technical communicators *could* do to demonstrate their value. It does not assess what technical communicators actually *are* doing, have time to do, or what is expected of them by their internal and external sponsors.

This study intends to address this gap by asking managers about the extent to which they track two key characteristics of value—the productivity and effectiveness of their staffs—as well as the expectations of their sponsors for receiving reports on these issues. Specifically, this study captured descriptive statistics about behaviors suggested by a related qualitative study (Carliner, in preparation), which we call *entering beliefs*. (Entering belief is a term we devised to represent the conclusions of the qualitative study.)

- Activities for tracking productivity by technical communication managers are limited.

- Technical communication groups rarely solicit feedback and perceptions on individual communication products.
- Technical communication groups employ usability testing on a limited basis.
- Customer surveys play an important role in assessing general impressions of technical communication products.
- Technical communicators rarely track return on investment (ROI).
- Technical communication managers feel limited pressure to report productivity and effectiveness.
- The most significant criteria against which the productivity and effectiveness of technical communication groups is assessed is word of mouth.

The following sections describe this study. The next section situates the study within the literature on demonstrating the value of technical communication products and services. Subsequent sections describe the methodology for conducting the study, present the results, and suggest conclusions that researchers and practicing professionals can draw from the data.

Literature Review

Technical communicators have tried to demonstrate the value of their services throughout the history of the profession. As far back as 1859, the U.S. Congress heard a report that, as a result of the publication of a guide for lighthouse operators, no preventable maritime disaster occurred in the previous year.

> While it is not fair to give the written instructions the entire credit for the improvement [technical advancements were introduced]…[These] comments regarding how the lights were kept is positive testimony to the value of the documentation. (Loges, 1998, p. 452)

With time, the conversation on demonstrating value in the literature has grown more sophisticated and specifically addresses three general issues: defining value, prescribing ways to measure value, and finding out how technical communicators actually track value on an ongoing basis. The following sections provide brief summaries of the literature on each of these issues and place this study within the context of this earlier work.

Defining Value

Despite the 1859 mention, most of the conversation about demonstrating the value of technical communication has occurred in the past 30 years. One of the first challenges in this conversation is defining the term value to ensure that all parties have a common understanding of the concept and to operationalize it for further study. Defining value is no easy task because concepts of the term are often personal and situational (Carliner, 2003). A quick-and-dirty help system that permits a small start-up to go to market with its software would easily satisfy its sponsors but would probably be insufficient to support a new release of Microsoft Word, which has extensive usability targets and editorial guidelines to meet before it is ready for release. More fundamentally, the "value" provided by both of these systems would be impossible to compare because neither definition provides a means for measuring the extent to which technical communicators have provided value. Redish (1995) addressed both concerns by defining value in financial terms:

> Value means generating greater return on investment than the cost of the initial investment. Return on investment can mean bringing in more money (or increasing users' satisfaction), or it can mean reducing costs, such as the cost of supporting customers. (p. 26)

Carliner (1998) broadens this definition of value to encompass both financial and non-financial elements. He defines "bringing in …money" as generating revenue, noting that pre-sales content, like marketing brochures, advertising, and white papers, primarily tackle such opportunities. He defines "reducing costs" as containing expenses, noting that, if actual sales increase, total support budgets will increase, but effective documentation might slow the rate of growth. He notes that post-sales and internal content, such as user assistance, references, and project documentation, primarily have responsibility for containing expenses. He adds a third category: complying with regulations. He notes that much content is provided because governments, industry associations, or corporate management require it. Organizations generally do not expect a financial return on such content. Rather, they approach such documentation as an insurance policy against fines (such as those imposed when organizations fail to provide documentation on occupational safety) or failure to qualify for certain organization-wide certifications, like ISO 9000.

These definitions are consistent with definitions of value used in marketing communications, which defines value in terms of the sales generated by marketing content (Wright-Isak, Faber, & Horner, 1997), and training and development, which defines value in terms of the return on investment (Bassi & McMurrer, 2007; Phillips 2003).

Prescribing Ways to Measure Value

In addition to defining value, the literature presents specific methods for demonstrating the value of technical communication products and services. One set of methods focuses on demonstrating the value *added* by technical communication products. Because demonstrating value-add requires extensive resources and months or years after publication, technical communicators also seek *proxy measures:* alternate measures that suggest that a communication product is likely to be developed productively or perform effectively. The following sections describe both of these prescriptive ways of demonstrating value, and comment on the challenges of collecting these types of data.

Demonstrating "Value-Added." Following the publication of a special issue of *Technical Communication* on demonstrating the value added by technical communication products and services in 1995, an implicit consensus emerged that "value" referred to the value *added,* and could be demonstrated by calculating some tangible, financial benefit that resulted from publishing the technical content.

To show readers how, a key component of this special issue was a series of case studies. Each showed how to determine the value added by technical communication products in a particular instance, such as user support and organization communication. But as these and more recent case studies (such as Blackwell, 1995; Daniel, 1995; Fisher, 1999; Henry, 1998; Spencer, 1995) suggest, because organizations develop individual communication products to achieve a unique set of objectives, quantifying the value added requires a unique methodology in each situation, one tailored to the specific value proposition of the communication product. As a result, although a general approach exists, no specific, standard methodology for calculating the value added really exists. When performed, these

Measures of Productivity and Effectiveness

calculations of value require a significant data collection effort and a similarly complex calculation.

Even when organizations invest this effort, the results are only approximations, as accounting systems that track revenues and expenses can only track transactions that actually occurred. When technical communication products contain expenses, the costs that are saved were never incurred. So the accounting systems have nothing to track. The best that technical communicators can do in such situations is show trends in spending before and after publication of the content to suggest that the cost savings have, indeed, occurred (Carliner, 1998).

Furthermore, organizations often cannot unambiguously attribute that savings to the publication of the technical content. For the oft-cited benefit of technical communication of a reduction in calls to a help line, Spilka (2000) notes that several alternative explanations could exist, such as end users refusing to call because of previous bad experiences with the help desk or finding a helpful co-worker to replace both the help line and the manual (Kay, 2007). Another problem with demonstrating the value added by individual technical communication products and services is that the data can only be collected long after publication, sometimes as long as 6 months to 2 years.

Collecting Proxy Measures of Value. Because gathering evidence of value added consumes time, and sponsors could question the results (Spilka, 2000), technical communicators have sought proxy measures of value: alternate measures that suggest that a communication product is likely to be developed productively or perform effectively. Proxy measures are generally easier to obtain than value added, can be collected during the development process or shortly thereafter. Most of these proxy measures sought have emerged from the quality movement (Smart, Seawright, & de Tienne, 1996), which identifies both product and process measures and attempts to measure both.

Product Measures focus on the effectiveness of the resulting technical communication product. Some organizations attempt to collect effectiveness measures during development of the technical content. Some are critical assessments, such as assessments from substantive and copy edits (Rook, 1993; Rude & Eaton, 2010), technical reviews, and heuristic reviews of the usability of content (Barnum, 2011). Each has its limitations; as

Van Buren and Buehler (2000) note, different levels of editorial reviews yield different types of feedback and assessments. Similarly, Lentz and De Jong (2009) and De Jong and Schellens (2000) raise concerns about the extent of actual usability problems identified by heuristic reviews. Others have attempted to turn these critical assessments into quantitative measures, such as counting comments on documents. Although the schemes continue (Swanwick & Leckenby, 2010), most technical communicators reject them because they tend to equate fewer comments with fewer defects in the content. In reality, the lack of comments might be more reflective of a reviewer who didn't read the draft. More costly pre-publication usability testing (De Jong & Schellens, 2000) provides empirical insights into the likely effectiveness of technical content, often under conditions that are, at the least, somewhat reflective of the actual context of use.

Carliner (1997) proposed an adaptation of Kirkpatrick's (1994) four-level model of evaluation for training for technical communication products. He defines effectiveness as a multi-layered construct, which encompasses both users' and sponsors' perceptions of communication products and the processes that created them, as well as measures that assess users' actual abilities to perform the tasks described in the communication products and sponsors' actual satisfaction with the communication product. Level 3 of this framework, client results, actually incorporates the demonstration of value added that Redish (1995) proposed.

Process Measures: Because of the limitations of pre-publication data on effectiveness and the challenges of collecting data post-publication, other organizations have sought to focus efforts on demonstrating the productivity and effectiveness of the processes that produce the communication products. Such efforts view the design and development of technical content from a systemic perspective (Hackos, 2007, 1994; Hargis, Carey, Hernandez, Hughes, Longo, Rouiller, & Wilde, 2004), noting that asking certain questions and performing certain work earlier in the process can minimize costly rework later in the process. Such efforts emphasize the importance of a well-defined process that can produce consistently high results on each project (Amidon & Blythe, 2008) and track adherence to the process, including the completion of each milestone in that process and adherence to the schedule and budget proposed for the project.

To ensure that the process can produce consistent results with similar amounts of labor, such approaches also emphasize tracking the quantity of work that technical communicators can produce (Swanwick & Leckenby, 2010). This measure of the amount of work that technical communicators produce in a given period of time defines the concept, *productivity*. To calculate productivity, managers must determine an average number of pages, screens or similar units that technical communicators can produce in a given amount of time—no easy task given that each project has its own level of complexity of content and team, and that different technical communicators have different strengths (Swanwick & Leckenby, 2010). Editors, in turn, have their own sets of productivity and effectiveness measures (Eaton, Brewer, Portewig, & Davidson, 2008; Swanwick & Leckenby, 2010).

The numbers resulting from these various schemes to track the effectiveness and productivity of technical communication work are called *metrics*. Many technical communicators use metrics to track their own work (Hamilton, 2009) and compare their rates with others, a process called *benchmarking* (Hackos, 1994). Benchmarking answers questions like these: If a technical communicator can produce one finished page in 6 hours, is that fast? Slow? Average? If a user's guide has a general satisfaction rate of a 3.95, how does that compare with other user's guides? In the absence of data clearly demonstrating a return on investment, the stronger one group's metrics appears in comparison to its own history and the metrics of other groups in the industry, the stronger the case that these proxy measures provide a manager that his or her group is providing value to the sponsor.

Challenges of Collecting These Measures: Most of the methods described in this sub-section are prescriptive—that is, they suggest what technical communicators should do. Most of these methods have not been validated in practice. Indeed, other than a few isolated case studies, no empirical study has explored the extent to which technical communicators use these methods.

What has been assessed is the appropriateness, feasibility, cost effectiveness, and persuasiveness of several commonly proposed means of measuring the value added by technical communication products and services. As part of the research underlying the special issue of *Technical Communication* on the value added

by technical communication products and services, Ramey (1995) surveyed technical communication managers about six commonly proposed measures and found that managers felt that measures focused on perceptions tended to be easier and more cost effective to collect and reasonably persuasive to their managers. In contrast, performance measures—such as the ability of users to perform tasks on their own and reductions in support costs—were generally perceived as more difficult to collect, although probably more persuasive to management than perception measures.

Finding Out How Technical Communicators Actually Track Value on an Ongoing Basis

So what are technical communicators actually doing to track the value of their products and services? Studies conducted infrequently over the past 25 years provide insights into actual practices by typical technical communication groups.

One of the earliest was a 1990 interview-based study by Barr and Rosenbaum (reprinted 2003), which explored the ways that technical communication managers tracked and reported productivity. They found that most managers used ad-hoc means of doing so, and only on a limited basis.

In an effort to get a sense of the actual workloads of technical communication managers, Carliner (2004) surveyed managers of larger technical communication groups (ones with 20 or more workers) about the work of their departments and the ways that managers tracked it. Like Barr and Rosenbaum, he found that most managers used ad-hoc means tracking both productivity and effectiveness, and only did so on a limited basis, often for less than 10% of projects.

Situating this Study

As suggested by the literature, this study defines the value added by technical communication in terms of two particular characteristics: *productivity*, the amount of technical content produced with the resources invested, and *effectiveness*, the extent to which technical communication products achieve the purposes for which they were developed. Productivity and effectiveness represent different measures of value and are not always compatible. Ensuring the effectiveness of content often involves efforts that reduce productivity and vice versa. Or as one author observed, producing "less" text often requires more work.

Measures of Productivity and Effectiveness

This study addresses the gaps in the literature on the methods used by technical communication managers to assess productivity and effectiveness, which have not been studied since 2004, and never explored across the entire population of technical communication managers. Furthermore, it provides updated insights into the types of measures that technical communication managers report to their managers—and what managers feel is persuasive evidence of productivity and effectiveness.

Methodology

This section describes the methodology followed to conduct the research. It first describes the choice of a research framework, then describes the selection of participants. Next we describe the survey and the processes for collecting and analyzing data. We close the section by describing methods to ensure the reliability and validity of the data.

Choice of a Research Framework

Given research questions that focused on determining the extent to which technical communication managers follow particular practices to track and report the productivity effectiveness of their staffs, we chose a quantitative methodology because quantitative research methodologies are designed to gather data from large numbers of participants (Creswell, 2008).

We specifically sought a quantitative methodology that would allow us to efficiently gather information from a potentially large population (as we assumed the population of technical communication managers to be); a survey seemed most appropriate (Creswell, 2008).

Participants

Because managers have the primary responsibility for generating work for a group and bear primary accountability for completing the work (Hackos, 1994, 2007), we specifically sought managers of technical communication groups as the participants for this study. Finding participants who met this characteristic posed two challenges to us. The first was clarifying what we meant by the term *manager*. Because we were concerned with the ways that managers report the productivity and effectiveness of their staffs, they needed to have responsibility for establishing performance plans for their staffs and evaluating performance against those

plans. Such tasks are generally considered to be core responsibilities of managers with personnel responsibility (Swanson & Holton, 2009).

The second challenge involved recruiting participants. Because funding was not available to rent mailing lists with the names of known managers of technical communication departments, we leveraged the power of the Web to recruit a convenience sample that met the characteristics we targeted.

We contacted professional organizations who serve and, therefore, might be able to reach, the likely participants: American Medical Writers' Association (notices sent to the organization and the presidents and newsletter editors of individual chapters), International Association of Business Communicators (notices sent to the presidents, newsletter editors, and Webmasters of local chapters), and Society for Technical Communication (notices sent to the presidents and newsletter editors of individual chapters, as well as the managers and newsletter editors of the Special Interest Group on Management).

We asked the people we contacted to publish the Call for Participants in their newsletters and on their Web sites and, if they send regular e-mail messages to their members, to mention the Call for Participants. The Call for Participants included a link to a Web site where prospective participants could learn more about the study. That site also included a link to the survey.

Ninety (90) technical communication managers completed the survey.

To ensure that all participants were informed of the purpose of the survey and the use of the results before participating, they first read and provided informed consent to participate. Because we did not provide participants with an opportunity to provide their names, all participants were anonymous. All procedures were reviewed and approved by the university Research Ethics Committee (similar to an Internal Review Board (IRB)).

About the Survey

The survey had several parts. The first collected demographic data, including the size of the group managed and the overall size and scope of the employer served (local, regional, national, international); the industry segment in which the employer operates, and the management experience and responsibilities of the participant. This would not only allow us to identify the participants but compare across groups.

The next section explored ways managers track and report productivity, including methods for estimating, tracking, and reporting productivity by project, budget, and overall operations.

Subsequent sections explored ways that managers track and report effectiveness. Questions addressed ways that managers track satisfaction with the communication products, the extent to which readers acted on the message in the communication products, and the impact of those actions.

The last section explored ways that managers report effectiveness as well as their perceptions about the importance of doing so.

Procedure for Collecting and Analyzing Data

In addition to using the Web as a recruiting tool, we also used it to conduct the survey. This afforded many advantages (Evan & Mathur, 2005), including (a) recruiting participants and conduct the survey in a short period of time, (b) offering convenience to participants, who would not have to keep track of a paper survey and make an effort to return it by surface mail, and (c) using the data as entered by participants in the analysis, thus eliminating errors resulting from re-entering the data. We used Web-based survey instrument, Hosted Survey, which let us administer the survey over the Web and let to collect the data in formats that could be read and used by reporting and analysis software, such as SPSS.

As part of the process of developing the survey, we validated it through two pilots. The first pilot primarily focused on the usability and clarity of the survey and related instructions. We provided participants in the pilot with a link to the draft survey and asked them to complete it. Among the issues that arose in the pilot were questions about who is a manager. We learned at this time that some technical communicators have the job title of *manager* but did not have responsibility for managing personnel, such as preparing job descriptions, hiring permanent employees, preparing performance plans, conducting performance reviews, and setting salaries and bonuses. Other workers had these responsibilities but used the title *supervisor* rather than *manager.* So we clarified our recruiting materials and, just in case prospective participants did not catch the clarifications in the recruiting statements, added questions at the beginning of the

survey about specific management responsibilities. Those participants who did not have responsibility for establishing performance plans and evaluating performance were directed out of the survey.

After validating the survey and related instructions, we began recruiting participants and tracking the progress of the study. To ensure a high response rate, we sent follow-up responses to our contacts in the local chapters of professional associations and, for those that have them, special interest groups. The recruiting and surveying process took eight weeks.

After the data was collected, it was downloaded in an Excel format for use with SPSS. We compiled results for each part of the survey.

To see whether certain characteristics of particular technical communication groups made them more or less likely to adopt a given practice, we ran cross-tabulations. Given the small size of the population and the even smaller sizes of these sub-groups, the resulting insights were more suggestive than generalizable.

Results

This section reports the results of the study. First, it reports the demographics of the participants. Next, it reports how technical communication managers assess productivity, then it reports how they assess effectiveness. Last, this section reports how the managers report productivity and effectiveness metrics to *their* managers and staffs.

Demographics of the Participants

The first set of questions was intended to build a profile of the managers participating in the study. Ultimately, we were hoping to find managers representing a diverse range of industries and that had a diverse scope of operations.

In terms of industry, the largest number of participants worked in high tech and telecommunications industries (39 participants or 43%). This finding is similar with other surveys of technical communicators, which suggests that high tech and telecommunications are the key industries employing technical communicators (STC). Of the rest of the participants, 14 (16%) worked in the manufacturing industry, and 9 (10%) worked in the financial services (including insurance) industries.

Measures of Productivity and Effectiveness

The rest were scattered among several industries, including 1 (1%) in the education industry, 3 (3%) in the energy industry, 3 (3%) in government, 2 (2%) worked in professional services, 1 (1%) in the real estate industry, 1 (1%) in the retail industry, 3 (3%) in the transportation industry, and 11 (12%) in other industries. Figure 1 shows where managers participating in this survey worked.
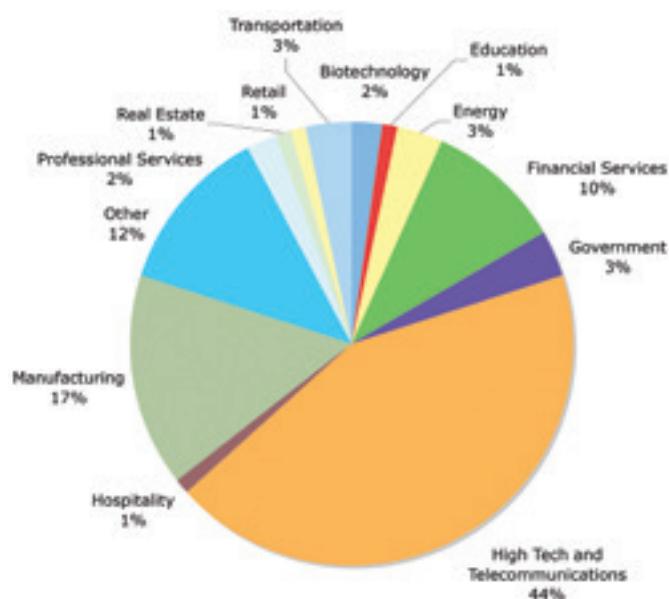
Figure 1. Industries in Which Managers Work

In terms of the size of the department managed, the majority (62%) managed groups of 10 or fewer workers. One conclusion is that technical communication groups tend to be somewhat small. Table 1 shows the size of groups managed.

Table 1. Size of Groups Managed

Size of technical communication staff	Number of responses	Percentage
5 or fewer	29	32%
6 to 10	27	30%
11 to15	9	10%
16 to 25	5	6%
26 to 50	11	12%
51 to 100	1	1%
Over 100	8	9%

In terms of the size of the organization supported by the technical communication group, the majority (57%) supported medium-sized groups with 101 to 2,500 workers and a logical conclusion is that the majority of technical communicator groups are in medium-size enterprises. Table 2 shows the size of organization supported by the technical communication staff.

Table 2. Size of the Organizations Supported by the Technical Communication Staff

Size of organization supported by the technical communication staff	Number of responses	Percentage
25 or fewer people	1	1%
26 to 50 people	5	6%
51 to 100 people	10	11%
101 to 250 people	13	14%
251 to 500 people	12	13%
501 to 1,000 people	15	17%
1,001 to 2,500 people	11	12%
2,501 to 5,000 people	10	11%
5,001 to 10,000 people	5	6%
10,001 to 25,000 people	4	4%
25,001 or more people	4	4%

The majority of participants 71 (79%) were from the United States. In addition, 7 (8%) were from Canada, 1 (1%) from China, 2 (2%) from the European Union, 7 (8%) from India, and 2 (2%) from other countries. We do not feel that this reflects demographics of the profession; rather, we think this reflects the membership of the organizations from which we sought participation.

In terms of the scope of operations, most participants 63 (70%) state their operations are global in scope. Of the rest, 2 (2%) have operations that focus on a single metropolitan area, 2 (2%) have operations that focus on the state or province in which they are located, 3 (3%) have operations that focus on the geographic region where we are located (such as the U.S. mid-Atlantic or New England regions), 14 (16%) have operations that are national in scope, and 5 (6%) have operations that are continental in scope.

In terms of management experience, most (57) of the managers responding to the survey had more than 5 years' experience. 2 (2%) had more than 25 years of experience, 5 (6%) 21 to 25 years, 9 (10%) 16 to 20 years, 16 (18%) had 11 to 15 years, 16 (18%) had 8 to 10 years, and 9 (10%) had 5 to 7 years. Of those with 5 years of experience or fewer, 9 (10%) had 4 to 5 years, 6 (7%) had 3 to 4 years, 8 (9%) had 2 to 3 years, and 8 (9%) had 1 to 2 years of experience. Only 2 (2%) had less than 1 year of experience.

Although the managers responding to this survey had extensive experience, most had a shorter tenure in their current position. Sixteen (16) (18%) had been in their current management role for less than 1 year, 18 (20%) had 1 to 2 years in their current role, 15 (17%) had 2 to 3 years, 8 (9%) had 3 to 4 years, 8 (9%) had 4 to 5 years, 12 (13%) had 5 to 7 years, 8 (9%) had 8 to 10 years, 3 (3%) had 11 to 15 years, 1 (1%) had been in the current management role for 16 to 20 years, and 1 (1%) had been in the role for more than 20 years.

In other words, sizable groups of the managers participating in the survey represented high tech and telecommunications firms, managed staffs of 10 or fewer workers, worked in medium-sized organizations that tended to have a global scope of operations. The typical manager responding to this survey had more than 5 years' experience in management but 5 years or less experience in their current positions, although managers with other levels of experience and scope of operations are represented.

How Technical Communication Managers Assess Productivity

This section reports how managers assess productivity and offers conclusions regarding the entering belief:

Activities for tracking productivity by technical communication managers are limited.

For the purpose of this study, productivity refers not only to how much work technical communication departments produce, but also related planning and payment activities. Specifically, this part of the survey reports on the methods that managers use to estimate and track projects, broader measures that managers use to track productivity, and a possible relationship of productivity to budgets, which we thought might exist.

The dominant method used for estimating projects is guess-timating based on experience (53 responses (59%)). Table 3 shows the different means that technical communication managers use to estimate projects.

Table 3. Primary Means Used by Technical Communication Managers to Estimate Projects

Method of estimating projects	Number of responses	Percentage
Guess-timating, based on experience	53	59%
Estimating based on the uses of industry standards	13	14%
Using historical data tracked through a project management system	12	13%
Working with deadlines assigned and making the schedule work	9	10%
Other means	3	3%
Did not know how projects were estimated	0	0%

Just over half of the participants (49 or 55 %) use a project tracking system to follow their projects; 41 participants (46%) do not. Of the 49 participants who have a project tracking system, 41 indicated why they track projects:

- "…because my sponsor requires me to" (19—46%—of the 41 participants).
- "… to ensure accurate billing for services" (17—42%—of the participants).
- "…as a basis for reporting the status of projects to sponsors" (12—29%—of the 41 participants).
- "… to determine whether projects are progressing according to plan" (7—17%—of the 41 participants).

Although one of the purposes of project tracking systems is informing future project management efforts (Lasecke, 1996), the majority of the participants (34 (83%) of the 41 participants who do use project management systems) do not use the data tracked by the project tracking systems.

Measures of Productivity and Effectiveness

Just 23 (26%) participants of this survey track their productivity rates. Of those who do:

- 13 of 23 participants (or 57%) track the number of pages produced per staff member per day
- 4 of 23 participants (or 17%) track the number of screens produced per staff member per day
- 10 of 23 participants (or 44%) track the average number of finished hours of instruction produced per staff member

The majority of participants (60 or 67%) are *not* required to report productivity to their bosses. Of those who are required to report their productivity measures, they report the following:

- Revenue generated by their departments (10 of 30 responses or 33%)
- A comparison of the output of the staff (in terms of dollars generated) with input (in terms of dollars invested) (14 of 30 or 47%)
- The number of hours of effort required to produce a finished page, screen or hour of instruction (11 of 30 or 37%)
- The number of people reached by the team's products, such as the number of people who have visited Web pages, or the number of people who have read publications (17 of 30 responses or 57%)

Thirty (30) participants, the largest number of people responding to this section of the survey, indicated "My boss does not ask for reports on productivity, so I do not provide them."

Because few of the managers who participated in the related qualitative study established their department budgets, we assumed that most technical communication managers did not participate in setting their budgets. The results of the survey suggested otherwise; 52 of 90 participants (58%) prepared the initial drafts of budgets for their staff. The extent of involvement was therefore higher than expected and did not support the entering belief.

Similarly, 54 (60%) knew their staffs' budgets. Of those who knew their budget, the items included in a staff's budget varied. Budgets included the following items:

- Salaries for staff (51 or 54 participants or 94%)
- The salary of the manager completing the survey (42 of 54 participants or 78%)
- Printing and warehousing costs for training and related materials (23 of 54 participants or 43%)
- Professional development and training costs for the technical communication staff (46 of 54 participants or 85%)

In other words, line items in the budgets vary widely among technical communication groups.

When asked "if you were to choose a measure to track the productivity of your team," 52 participants (58%) said that they would know what the measure would be.

- Twenty seven (27) of the 43 write-in responses related the amount of work produced per unit of time, such as the number of screens or help topics produced per day.
- Sixteen (16) of the responses focused on meeting deadlines.
- The remaining response was "cost per type of attraction."

Figure 2 presents the write-in responses.

When asked "if your boss were to ask you to track the productivity of your team, what measure do you think your boss would require?" about half (46 or 50%) of technical communication managers would probably be at a loss.

All the same, productivity measures were used to determine staff salaries or bonuses in the organizations of 33 participants (37% of all the participants). Of those 33, 97% use this productivity data to determine salary increases and 82% use the productivity data to determine bonuses.

To determine whether larger departments were more likely to track productivity, we ran cross-tabulations comparing size of department and the requirement to track productivity. Only in organizations with 250 or fewer staff were participants more likely to report productivity. Because the number of participants in those categories was small, however, these results might not be replicated in a broader study. Table 4 presents the cross-tabulations.

Category 1: Meeting deadlines
1. Percentage of self-assigned tasks completed by a set deadline
2. Productivity would be (and is to much extent) measured on the ability to meet deadlines (paired with the quality of the end result).
3. A combo of % deadlines made without strife, employee satisfaction, and # customer interactions. Achievement = writer sat = customer sat. (B!)
4. Meeting milestones, number of documents, number of pages per document, tempered against complexity and engineer/writer ratios
5. Quality of deliverables prepared within the estimated timelines – for instance, bugs found in the guides, volume and type of comments from other teams
6. A compilation of historical data for similar projects
7. If all documentation requests were done by deadline
8. It would some combination of page and deliverable counts balanced against reader satisfaction over the span of the project
9. Various metrics—project tracking—hours of instruction
10. Deadlines met, adherence to industry standards, customer satisfaction
11. Deliverables (pages/help topics per project day)
12. Documents produced within schedule in within budget
13. Updated help systems with release notes delivered to development according to the development build schedules
14. Verifying the pre-defined milestones against the dates and estimating the performance as on date
15. On time and on budget deliverables meeting quality metrics
16. Actuals (time spent on tech comm tasks) and Annuals (type/complexity/deliverable)

Category 2: Amount produced in a given period of time
1. Several—time used/time estimated, % projects done on time, time used to complete a certain task compared to others on the team
2. The amount of pages/topics written, including graphics production
3. Number of pages
4. Number of pages drafted or number of PowerPoint slides completed
5. Number of pages or screens per day.
6. Number of planned projects completed and hours per page
7. Number of projects completed per quarter
8. Number of projects completed/quarter/year, etc. and cost per project/quarter. year. etc.
9. Number of screens per day
10. Number/difficulty of projects completed within budget
11. Output
12. Page/day, along with quality survey
13. Pages of published documentation each week
14. Pages produced per cycle
15. Policies/document/manuals per month. Everything here is from scratch, so productivity is measured through direct publication to users.
16. Number of available hours vs. time spent working on active projects factored by completion rate/meeting deadlines
17. Number of completed projects per year, weighted for project size
18. Number of enhancements or defects resolved and hours to resolve them against the baseline of the project plan
19. Number of hours/pages produced compared to standard, timely delivery, accuracy of material, processes followed, conformity to style guidelines
20. Items produced/ created per time unit
21. Compare estimated hours to actual hours for development of course materials and online help
22. Completed deliverables, compared to number of staff and number of supported products (compared to previous years)
23. Different measures for different types of work: Pages of print manuals, Topics of online
24. Help, and Issues (internal issues tracked by my company)
25. Hours per page including the management, writer or writers, editing, and production
26. Hours/page
27. Cost per type of attraction

Category 3: Other
Profitability on contract in a simple load model (gross revenue generated—(raw costs + pro-rated overhead)

Figure 2. Write-in Responses Suggesting How Technical Communication Managers Would Assess Productivity

Measures of Productivity and Effectiveness

Table 4. Cross-Tabulation of Size of Organization and the Requirement of Technical Communication Managers to Report Productivity to Their Bosses

Size of organization supported	Required to report productivity?	
	No	Yes
25 or fewer	0	1
26–50	2	3
51–100	7	3
101–250	6	7
251–500	10	2
501–1,000	11	4
1,001–2,500	8	3
2,501–5,000	9	1
5,001–10,000	3	2
10,001–25,000	2	2
25,001 or more	2	2

We also ran cross-tabulations to determine whether the size of the team that a technical communication manager oversaw or the industry in which the manager worked had an impact on the likelihood of reporting productivity. But in every size category and in every industry, those who were not required to report productivity outnumbered those who were required to do so. Similarly, active involvement in setting the department budget was not related to a requirement to report productivity.

Given that:

- The dominant method of estimating projects is guess-timating,
- Just 55% of participants use a project tracking system and less than 25% of those use the project tracking system to report on projects,
- Only one-third of participants said that they were required to report productivity, and
- More than half of the participants indicated that they were not aware that of a productivity measure that their managers expected them to report.

The data supports the entering belief, "Activities for tracking productivity by technical communication managers are limited."

How Technical Communication Managers Assess Effectiveness

This section reports how managers assess effectiveness and offers conclusions regarding the entering beliefs:

- Technical communication groups rarely solicit feedback and perceptions on individual communication products.
- Technical communication groups employ usability testing on a limited basis.

Specifically, this part of the survey reports on the methods that managers use to solicit different measures of the effectiveness of communication products, including user feedback, usability, general perceptions of technical communication products and services, and the value added by—or return on investment in—technical communication products and services.

Practices for Soliciting Immediate Feedback from Users. Previous research suggests that technical communicators use a couple of methods to solicit immediate feedback from users, and neither is widely used (Carliner, 2004). One is Reader's Comment Forms (RCFs), which are primarily included with printed materials and solicit feedback regarding the technical accuracy of the content. Another is satisfaction surveys, which are included with both printed and online materials. Sometimes the satisfaction surveys pertain to an entire document (what did you think of the user's guide?); in other instances, the survey pertains to an individual Web page (did this page help you?).

The evidence supports previous research. Of those responding, only 24 (27%) provide Reader's Comment Forms with the materials they publish. (Note that not all of the technical communication managers participating in this survey answered this question.)

Of those providing Readers' Comment Forms, 18 of 24 (21% of the total participants) provide them for user's guides, 15 of 24 (17%) for references, 18 of 24 (21%) for Help (online user assistance), 14 of 24 (16%) for service guides, and 11 (13%) for other types of technical communication products. Table 5 shows the extent of use of Reader's Comment Forms for different types of technical communication products.

Table 5. Extent of Use of Reader's Comment Forms for Different Types of Technical Communication Products

Type of technical communication product	Number of responses	Percentage
User's guides	18	20%
References	15	17%
Help (user assistance)	18	20%
Service guides	14	16%
Other	11	13%

Participants primarily use Reader's Comment Forms to track feedback on the accuracy and general usability of the content, and user satisfaction. Consider these uses of Reader's Comment Forms:

- Information about technical errors in the content (21 responses, 24%)
- Feedback on the general usability of the content (apart from technical errors) (21 responses, 24%)
- Feedback on users' general levels of satisfaction with the content (21 responses, 24%)

Table 6 summarizes the types of feedback sought by Reader's Comment Forms.

Table 6. Types of Feedback Sought by Reader's Comment Forms

Type of feedback sought	Number indicating that they use Reader's Comment Forms for this purpose	Percentage
Technical errors in content	21	24%
General usability of the content (apart from technical errors)	21	24%
Feedback on users' general levels of satisfaction with the content	21	24%
Other types of feedback	11	13%

The extent to which Reader's Comment Forms are used is mixed, with responses ranging from nearly all material published to less than 10%. Table 7 shows the usage rates for Reader's Comment Forms.

Table 7. Usage Rates for Reader's Comment Forms

Percentage of materials published for which reader's comment forms are provided	Number of responses	Percentage
76 to 100% of all materials published	11	13 %
51 to 75%	2	2%
26 to 50%	2	2%
10 to 25%	1	1%
Less than 10%	8	9%

In general, response rates to Reader's Comment Forms are extremely low. Eighty (80) (93%) participants have a response rate of less than 10%. Table 8 shows the response rates for Reader's Comment Forms.

Table 8. Response Rates for Reader's Comment Forms

Average response rate	Number of responses	Percentage
76 to 100% of all forms distributed	1	1%
51 to 75%	1	1%
26 to 50%	0	0%
10 to 25%	4	5%
Less than 10%	80	93%

Cross-tabulations suggest that Readers' Comments' Forms were more likely to be used in certain types of organizations, including ones with 26 to 50 workers, and those with 2,501 through 25,000 workers. Table 9 shows this cross-tabulation.

Cross-tabulations also suggest that technical communication groups with 26 to 50 staff are more likely to use Reader's Comment Forms than groups of other sizes, and those working in the energy industry are more likely to use Reader's Comment Forms than people in other industries.

Measures of Productivity and Effectiveness

Table 9. Cross-Tabulation Linking Size of Organization Supported and the Use of Reader's Comment Forms

Size of organization supported	Use Reader's Comment Forms?		
	No response	No	Yes
25 or fewer	1	0	0
26–50	0	3	2
51–100	0	9	1
101–250	0	12	1
251–500	0	8	4
501–1,000	1	11	3
1,001–2,500	1	8	2
2,501–5,000	1	4	5
5,001–10,000	0	2	3
10,001–25,000	0	2	2
25,001 or more	0	3	1

Given that only 27% of participant use Readers' Comment Forms and, when they do, the majority have a response rate of 10% or less, the evidence supports the entering belief that technical communication groups rarely solicit feedback and perceptions on individual communication products. Furthermore, the evidence suggests that when technical communicators do solicit this type of feedback, the response is low. All the same, the evidence also suggests that the feedback can provide insights into the accuracy, usability and perception of these communication products.

Use of Usability Tests. Usability tests assess the extent to which users can actually perform the tasks and procedures described in communication products (Barnum, 2010). Because usability tests provide insights into the effectiveness of the work of technical communicators, the literature on the field identifies these tests as a key tool for all technical communication products (Markel, 2009). Yet previous studies (such as Carliner, 2004, in preparation) suggest the entering belief that technical communication groups conduct usability testing on a limited basis. The next section sought evidence to address this entering belief.

In terms of the extent to which technical communication groups perform usability testing, 49 (54%) of participants said that some or all of the content that their teams produce undergoes usability tests, 37 (41%) said that the content they produce does not, and 4 (4%) participants did not respond.

When usability testing is performed, 24 (27%) use it to test an entire product or service, including the documentation (that is, a broader test than just one of the documentation). Four (4) (4%) use it only to test the interface—and documentation is considered separate from the interface, 18 (20%) use it to test only the documentation, and 3 (3%) use usability testing for some other purpose.

Thirty eight (38) of participants (42%) conduct usability tests while a product and its documentation are still in development; 8 (9%) conduct usability testing after general release of the product and documentation, and 3 (3%) conduct usability tests at some other time. Forty one (41) or 46% participants did not respond.

Twenty three (23) participants (26%) said that someone on their immediate staff has primary responsibility for conducting the usability test while 26 (29%) said that someone from outside of their immediate staff has primary responsibility for conducting the test.

In terms of the extent of usability testing, the majority of those who conduct it test 25% or fewer of their communication products. Table 10 presents the overall extent to which usability testing is performed.

Table 10. Extent to Which Usability Testing Is Performed

Percentage of materials published for which usability testing is performed	Number of responses	Percentage
76 to 100% of all materials published	10	4%
51 to 75%	5	6%
26 to 50%	6	7%
10 to 25%	14	16%
Less than 10%	14	16%

Cross-tabulations suggest that usability testing was more likely to be performed in organizations with 26 to 50 workers, 251 to 500 workers, and 1,001 to 5,000 workers. Table 11 shows the cross-tabulation linking size of organization and likelihood of conducting usability testing.

Table 11. Cross-Tabulation Linking Size of Organization Supported and the Performance of Usability Tests

Size of organization supported	Perform usability tests?		
	No response	No	Yes
25 or fewer	1	0	0
26–50	0	2	3
51–100	0	5	5
101–250	0	7	6
251–500	0	4	8
501–1,000	1	8	6
1,001–2,500	1	1	9
2,501–5,000	1	1	8
5,001–10,000	0	4	1
10,001–25,000	0	3	1
25,001 or more	0	2	2

Cross-tabulations also suggest that technical communication groups with 11 to 50 workers were more likely to conduct usability testing than those in other size ranges. Table 12 presents this cross-tabulation.

Table 12. Cross-Tabulation Linking Size of Technical Communication Group and the Performance of Usability Tests

Size of technical communication group	Perform usability tests?		
	No response	No	Yes
5 or less	0	14	15
6–10	2	11	14
11–15	1	2	6
16–25	0	0	5
26–50	0	4	7
51–100	0	1	0
Over 100	1	5	2

In addition, cross-tabulations show that technical communicators working in the high tech and telecommunications, hospitality, manufacturing, and other industry groups were more likely to conduct usability testing than technical communicators working in other industries. (Because only 1 person identified as

Education and responded to this question, the sample is too small to reach a conclusion.) Table 13 presents this cross-tabulation.

Table 13. Cross-Tabulation Linking Industry and the Performance of Usability Tests

Industry	Perform usability tests?		
	No response	No	Yes
Biotechnology	0	2	0
Education	0	0	1
Energy	0	0	3
Financial services	1	5	3
Government	0	2	1
High tech and telecommunications	0	18	21
Hospitality	0	0	1
Manufacturing	0	4	10
Other	1	3	7
Professional services	0	2	0
Real estate	0	0	1
Retail	1	0	0

Last, technical communicators who knew their budget and actively participated in setting it were more likely to perform usability testing than those who do not. Table 14 presents this cross-tabulation.

Table 14. Cross-Tabulation Linking Budget Activities and the Performance of Usability Tests

Know the technical communication group budget?	Perform usability tests?		
	No response	No	Yes
No	1	19	16
Yes	3	18	33

Participate in seeing the technical communication group budget?	Perform usability tests?		
	No response	No	Yes
No	1	18	19
Yes	3	19	30

Measures of Productivity and Effectiveness

Given that only just over half of the technical communication groups conduct any usability testing, that the majority of those conducting usability tests address both a product and its documentation, that the majority of those conducting usability testing only do so for 25% or less of their work, and that more than half of the usability testing is conducted by someone outside of the technical communication group, we find that the evidence supports the second entering belief: technical communication groups employ usability testing on a limited basis.

Tracking Perception of Technical Communication Efforts. Previous research suggests that one of the ways that technical communicators assess the long-term impact of their work is through responses to questions posed to customers in semi-annual, annual, and bi-annual opinion surveys (the surveying schedule varied among organizations). This prompted the entering belief that customer surveys play an important role in assessing general impressions of technical communication products. The next section of the survey assessed the nature and extent of practices associated with customer surveys.

Only 36% of participants (32) said that they use opinion surveys to track the perceptions of the technical communication products produced by their teams.

Table 15. Ways That Organizations Track Perceptions of Technical Communication Products

Method of tracking	Number of responses	Percentage
A larger survey about their organization (such as a customer perception study about the company, rather than customers perceptions about a particular product (the previous response))	23	26%
A separate survey just pertaining to documentation (such as (but not limited to) a general customer survey of their satisfaction with the product)	13	14%
Other	9	10%

In terms of the way that organizations track perceptions, the largest percentage of participants (23 or 26%) said that their organizations do so through a larger survey about their organization, such as a customer survey, rather than customer perceptions about a particular product. Only 13 participants (14%) said that their organizations conduct a separate survey just about documentation. Table 15 lists the ways that organizations track perceptions of technical communication products.

Cross-tabulations suggest that perception surveys were more likely to be used in by technical communication groups in organizations with 1,001 to 2,500 workers. Table 16 shows this cross-tabulation.

Table 16. Cross-Tabulation Linking Size of Organization and the Likelihood of Conducting Perception Surveys

Size of organization supported	Perform perception surveys?		
	No response	No	Yes
25 or fewer	1	0	0
26–50	0	1	4
51–100	0	8	2
101–250	0	7	6
251–500	0	9	3
501–1,000	1	8	6
1,001–2,500	1	4	6
2,501–5,000	1	7	2
5,001–10,000	0	4	1
10,001–25,000	0	3	1
25,001 or more	0	3	1

Other cross-tabulations suggest that technical communication groups with 26 to 50 workers were more likely to conduct perception studies; Table 17 shows this cross-tabulation.

Additional cross-tabulations suggest that technical communicators in the high tech industry were also more likely to conduct perception studies than technical communicators working in other industries. Table 18 shows the cross-tabulations.

Table 17. Cross-Tabulation Linking Size of Technical Communication Group and Likelihood of Conducting Perception Surveys

Size of technical communication group	Perform perception surveys?		
	No response	No	Yes
5 or less	0	18	11
6–10	2	15	10
11–15	1	7	1
16–25	0	3	2
26–50	0	4	7
51–100	0	1	0
Over 100	1	6	1

Table 18. Cross-Tabulation Linking Industry and Likelihood of Conducting Perception Surveys

Industry	Perform perception surveys?		
	No response	No	Yes
Biotechnology	0	2	0
Education	0	1	0
Energy	0	3	0
Financial services	1	6	2
Government	0	3	0
High tech and telecommunications	0	18	21
Hospitality	0	1	0
Manufacturing	0	10	4
Other	1	7	3
Professional services	0	1	1
Real estate	0	0	1
Retail	1	0	0
Transportation	1	1	1

Cross-tabulations did not suggest any effect of the technical communication manager's knowledge of—or involvement in setting—the budget for the group and the likelihood of conducting perception studies.

Given that just 36% of participants stated that their organizations use surveys to track perceptions,

the entering belief that customer surveys play an important role in assessing general impressions of technical communication products is only partially supported. The surveys are used, but not widely. The evidence suggests that the surveys play a more significant role in some industries (like high tech) and organizations of a particular size.

Tracking Return on Investment. Both the peer-reviewed (such as Redish, 1995) and popular literature (such as Rockley, 2004) advise professional technical communicators to demonstrate the positive financial impact of their communication products on organizations by contrasting the investment in designing and developing effective documentation with the resulting benefits, such as a reduction in the volume of calls to a help line (Downing, 2007; Spencer 1995) or reduction in rework (Daniel, 1995). Earlier empirical studies (such as Carliner, 2004; Ramey, 1995) suggest that technical communicators rarely perform these types of evaluations. This prompted the entering belief that technical communicators rarely track ROI, a belief explored in the next section of the survey.

According to the results, just 9% (8 of the participants) determine ROI for some or all of the technical communication products their team produces. Of the few who do determine ROI:

- Three calculated costs versus revenues (though they did not mention the source of these revenues),
- Three compared the cost of technical communication products with the cost of support,
- One compared the cost of developing technical communication products internally and externally, and
- One used an electronic ROI calculator (though did not identify the source of this calculator).

Figure 3 lists all of the methods participants used to calculate ROI.

Among the few who do calculate ROI, half do so for 25% or fewer of the work they produce. Table 19 shows the extent to which technical communication managers calculate ROI.

Measures of Productivity and Effectiveness

Category 1: Income versus Costs
- Cost to develop materials vs. amount of revenue generated by the course.
- Total burdened cost against revenue
- ROI = Income/Assets Used

Category 2: Cost of Technical Communication Products versus the Cost of Support
- # of Help Desk Training calls per month* Hourly rate. This is compared with total time spent on online delivery of information. As # of documents increase, calls decrease. $ saved is compared to cost of tools.
- track the support costs and measure the contribution of documentation and training in reducing it (approximation)
- (reduction in returns + reduction in support costs)—cost of documentation development [we are not responsible for production or production costs] OR (product developer time * loaded product developer costs)—cost of documentation development

Category 3: Comparison of Internal and External Costs
- Cost of internally developed project vs. outsourcing that project compared to income generated.

Category 4: Other
- We use an electronic ROI calculator to determine.

Figure 3. How Participants Calculate ROI

Cross-tabulations only suggested that calculations of ROI were more likely to be performed by technical communication groups who knew their budget and who actively participated in setting it. Table 20 shows the cross-tabulation.

Given that fewer than 10% of participants indicated that they calculate the ROI of technical communication products and, of those, half only calculate ROI for less than 25% or fewer of the technical communication products they produce, the evidence supports the entering believe that technical communicators rarely track ROI.

Table 19. Extent to Which Technical Communication Managers Calculate ROI

Percentage of materials for which ROI is calculated	Number of responses	Percentage
76 to 100% of all materials published	2	2%
51 to 75%	1	1%
26 to 50%	1	1%
10 to 25%	2	2%
Less than 10%	2	2%

Table 20. Cross-Tabulation Linking Budget Activities and the Likelihood of Calculating ROI

	Calculate ROI?		
Know the technical communication group budget?	**No response**	**No**	**Yes**
No	1	33	2
Yes	3	45	6
	Calculate ROI?		
Participate in setting the technical communication group budget?	**No response**	**No**	**Yes**
No	1	36	1
Yes	3	48	7

Note: These numbers are not strong enough to report a statistically valid pattern, but it's pronounced enough we wanted to note it.

Reporting Effectiveness and Productivity Measures

The last section of the survey explored how managers report the effectiveness and productivity of their staffs to others in their organizations. These questions specifically assessed two entering beliefs:

- Technical communication managers felt limited pressure to report effectiveness..
- The most significant criteria against which the effectiveness of their staffs is assessed is word of mouth.

Fewer than half of the participants (40 or 44%) were required to report the effectiveness of their staffs.

Cross-tabulations suggest that technical communication groups supporting organizations of 26 to 50, 101 to 250, 5,001 to 10,000 and 25,001 and more workers are most likely to report effectiveness. Table 21 presents the cross-tabulations.

Table 21. Cross-Tabulation Linking Size of Organization and the Requirement to Report Effectiveness

Size of organization supported	Required to report effectiveness?		
	No response	No	Yes
25 or fewer	1	0	0
26–50	0	1	4
51–100	0	7	3
101–250	0	6	7
251–500	0	7	5
501–1,000	1	8	5
1,001–2,500	1	5	5
2,501–5,000	1	6	3
5,001–10,000	0	2	3
10,001–25,000	0	1	3
25,001 or more	0	3	1

Table 22. Cross-Tabulation Linking Size of Technical Communication Team and the Requirement to Report Effectiveness

Size of technical communication group	Required to report effectiveness?		
	No response	No	Yes
5 or less	0	17	12
6–10	2	12	13
11–15	1	4	4
16–25	0	4	1
26–50	0	5	6
51–100	0	1	0
Over 100	1	3	4

A second characteristic affecting the likelihood of reporting effectiveness is size of the technical communication group itself. Cross-tabulations suggest that technical communication groups with 6 to 10, 26 to 50 or more than 100 workers are more likely to report effectiveness than other sized groups. Table 22 presents the cross-tabulations.

A third characteristic affecting the likelihood of reporting effectiveness is industry. Cross-tabulations suggest that technical communication groups working in the financial services, government, and other industries are more likely to report effectiveness than groups working in other industries. Table 23 presents these cross-tabulations.

Table 23. Cross-Tabulation Linking Industry of Technical Communication Team and the Requirement to Report Effectiveness

Industry	Required to report effectiveness?		
	No response	No	Yes
Biotechnology	0	1	1
Education	0	0	1
Energy	0	2	1
Financial services	1	2	6
Government	0	1	2
High tech and telecommunications	0	25	14
Hospitality	0	1	0
Manufacturing	0	8	6
Other	1	4	6
Professional services	0	1	1
Real estate	0	0	1
Retail	1	0	0
Transportation	1	1	1

The last characteristic affecting the likelihood of reporting effectiveness is whether the technical communication manager participated in drafting the budget for his or her team. Cross-tabulations suggest that managers who do are more likely to report effectiveness than those who do not. Table 24 presents the cross-tabulations.

Measures of Productivity and Effectiveness

Table 24. Cross-Tabulation Linking Size of Technical Communication Team and the Requirement to Report Effectiveness

Participate in setting the technical communication group budget?	Required to report effectiveness?		
	No response	No	Yes
No	1	22	15
Yes	3	24	25

Note: These numbers are not strong enough to report a statistically valid pattern, but it's pronounced enough we wanted to note it.

In terms of specific measures requested of technical communication managers by their sponsors, slightly fewer than one-third of participants (29 or 32%) said that they were required to report results of surveys. Fewer than one-fifth of the participants (17 or 19%) are required to report the results of usability tests. Fewer than one-sixth (12 or 13%) are required to report results Reader's Comment Forms or were requested to report other types of measures of effectiveness. Table 25 presents the measures of effectiveness requested by sponsors of technical communication.

Managers identified other measures used by sponsors to track the effectiveness of technical communication teams. The most commonly indicated one was word-of-mouth (informal positive and negative feedback about the staff) reported by 74 participants (82%). Other measures include:

- Service quality—how well the staff services the requests that are received, such as turnaround time on requests (55 participants or 61%)
- Reach—the number of users the technical communication group has reached in a given year (20 participants or 22%)

About one-fifth of the participants (19 or 21%) do not know how their sponsors assess the effectiveness of their groups.

In terms of the most important measure of effectiveness to sponsors, the largest number of participants (33 or 37%) reported word of mouth. Service quality was the second most important measure (25 participants or 28%). Table 26 presents the most important measures to sponsors of the effectiveness of technical communication.

The most common means of reporting the productivity and effectiveness of the technical communication group is a regularly produced report, such as a monthly or quarterly report (48 responses or 53%). Next most common is "when it comes up in conversation" (19 responses or 21%). About 10% (9 participants) do not report results. Table 27 shows the means that managers use to report the results of their training teams.

In terms of whether effectiveness or productivity metrics are more important, nearly two-thirds (59 or 66%) felt the two types of metrics were equally important.

Similarly, in terms of *reporting* metrics, nearly three-fifths of participants (53 or 59%) felt that reporting both types of metrics is important.

In terms of satisfaction with the measures they use to track and report effectiveness, the majority of participants felt that the measures were not adequate. Twenty one (21) (23%) did not think the measures used were representative at all and another 37 (41%) felt that the metrics they used were representative, but extremely incomplete (complete means that they represent all aspects of the group's work). Table 28 presents managers' satisfaction with the measures used to reflect the effectiveness of their staffs' work.

When asked about the relative importance of tracking metrics of productivity and effectiveness among

Table 25. Measures of Effectiveness Requested by Sponsors of Technical Communication

Measure of effectiveness	Number for whom this is requested	Percentage	Number not requested to provide it	Percentage
Surveys	29	32%	57	63%
Usability tests	17	19%	69	77%
Reader's Comment Forms	12	13%	74	82%
Other	9	10%	77	86%

all tasks performed by their staffs, three-quarters of the participants did not feel it was an important task: 23 (26%) felt that this reporting was not important at all, and 45 (50%) said it was only moderately important. Table 29 shows the perceived importance of tracking measures of productivity and effectiveness.

Table 26. The Most Important Measures to Sponsors of the Effectiveness of Technical Communication

Measure	Number indicating it	Percentage
Word of mouth (informal positive and negative feedback about my staff)	33	37%
Service quality—that is, how well the staff services the requests that are received, such as turnaround time on requests	25	28%
My sponsor does not really understand the work of my team and does not have any means of assessing it	7	8%
Surveys	5	6%
Usability test results	2	2%
ROI	2	2%
Reach—that is, the number of users the staff has reached in a given year	1	1%
Reader's Comment Forms	0	0%
Other	4	4%
I do not know how my sponsor assesses the effectiveness of my team	7	8%

Table 27. Means Used by Managers to Report the Results oOf Their Technical Communication Teams

Means used to report results	Number using it	Percentage
A report that is produced regularly throughout the year, such as monthly or quarterly	48	53%
When it comes up in conversation	19	21%
I don't report the results	9	10%
An annual report	4	4%
Other	6	7%

Table 28. Managers' Satisfaction with the Measures Used to Reflect the Effectiveness of Their Staffs' Work

Statement regarding satisfaction	Number choosing this statement	Percentage
I think they're representative and thoroughly complete	1	1%
I think they're representative, and mostly complete	27	30%
I think they're representative, but extremely incomplete	37	41%
I don't think they're representative at all	21	23%

Note: Complete means that they represent al aspects of your team's work.

Table 29. Perceived Importance of Tracking Measures of Productivity and Effectiveness

Importance of tracking measures of productivity and effectiveness	Number responding	Percentage
Not important at all	23	26%
Moderately important	45	50%
Very important	16	18%
One of the two most important tasks my group does	2	2%

Measures of Productivity and Effectiveness

Last, participants were asked whether their organizations use effectiveness measures to determine staff salaries or bonuses. Over half (48 or 53%) indicated no. Of those using effectiveness metrics to determine salaries or bonuses, 37 (41%) said they use them to determine salaries and 28 (31%) use them to determine bonuses.

Given that just 44% of the participants were required to report the effectiveness of their staffs, and that 76 % felt that reporting productivity and effectiveness measures was, at best, only moderately important, the entering belief that that technical communication managers felt limited pressure to report productivity and effectiveness is supported by the data.

Furthermore, given that the technical communication managers participating in this survey chose word of mouth and service quality as the two most important measures to their sponsors—and that participants chose these responses 4.7 and 3.6 times more frequently than the third most common response suggests that the evidence supports the entering belief that word of mouth is the most significant criteria against which the productivity and effectiveness of technical communication staffs is assessed. Not only was use of other means much lower, but the technical communication managers who participated in this study did not have a high level of satisfaction with the measures available to them.

Discussion and Conclusions

This section considers what these results mean. First, we suggest the implications of these results for practicing professionals. Next, we consider the limitations of these results. We close by suggesting future research.

Implications
This survey-based study provides evidence that supports most of the entering beliefs of this study:

- Activities for tracking productivity by technical communication managers are limited.
- Technical communication groups rarely solicit feedback and perceptions on individual communication products.
- Technical communication groups employ usability testing on a limited basis.
- Technical communicators rarely track ROI.

- Technical communication managers feel limited pressure to report productivity and effectiveness.
- The most significant criteria against which the productivity and effectiveness of technical communication groups is assessed is word of mouth.

The evidence also suggests that service quality (perceptions of the quality and responsiveness of the service provided by technical communicators to the people who hire them rather than the users who ultimately benefit from the end products) is another significant criteria against which the productivity and effectiveness of technical communication groups is assessed (which was not an entering belief). The evidence suggests, too, that customer surveys do not play as strong a role in assessing general impressions of technical communication products and services as expected at the onset of the study.

In addition, the cross-tabs hint that pressures to report vary among groups of different sizes, in different industries, and in different size of enterprises. That only makes finding consensus metrics that are useful in all situations all the more challenging.

To be honest, these results are not surprising. They confirm findings from the earlier empirical studies of practice by technical communication managers, such as Barr and Rosenbaum's (1990) study of the productivity of technical communication managers, Ramey's (1995) study of the perceptions of measuring value added, and Carliner's (2004) study of the management portfolios of technical communication managers.

But they do have serious implications for practicing professionals. Despite a discussion about means of assessing the productivity and effectiveness of technical communicators that has spanned over a quarter of a century, the evidence suggests that none of the methods of assessment has reached wide use. Methods like Readers' Comment Forms, perception studies, and return on investment are only used by a minority of technical communication groups. Usability testing is more widely performed, but still performed sparingly—both in terms of the number of organizations conducting these tests and the number of technical communication products tested. Few assessments of the productivity of technical communicators exist and, of those that do, none is in use by even a sizable minority of technical communication groups. Given the

limited use of observable and measurable metrics to assess productivity and effectiveness, and the more widespread use of untracked perceptions (especially word-of-mouth and service quality), that technical communication managers report low satisfaction with the means used to assess the productivity and effectiveness of their groups should not be surprising.

Given this void of useful measurements of productivity and effectiveness, what is surprising is that the issue has generated little interest at all, much less sustained interest within the research community.

The evidence from this study suggests that, instead of quantifiable measures, the most common means of assessing the productivity and effectiveness of technical communicators is word-of-mouth and service quality—that is, perceptions of the quality and responsiveness of the service provided by technical communicators to the people who hire them, not the users who ultimately benefit from the end products.

That technical communicators would seek valid, generalizable quantitative measures of their productivity and effectiveness is understandable, given that the majority work in engineering- and science-based environments, like high technology and telecommunications firms, defense contractors, and engineering firms, which are known for assessing themselves on quantitative measures. Furthermore, given that the majority of technical communicators work in private corporations that measure their success in financial terms, the search for similar financial measures to assess the contributions of technical communication is also understandable.

But apparently, it's not done. And in the few instances when it is performed, the measures that have been developed are, at best, imprecise. For example, because accounting systems can only measure money that was actually spent, the cost savings offered by technical communication products are, at best, just an estimate. Furthermore, many of these estimates rely on imprecise and often inaccurate data that is self-reported by participants, further reducing the credibility of such measures. Most significantly, most of the means for deriving more precise measures are cumbersome and time consuming, and time-constrained technical communicators can often spend their time more productively working on other tasks. Ramey (1995) identified this practical concern two decades ago; the situation has not changed since.

So instead of focusing on ROI, perhaps tracking perceptions of the service provided by technical communicators might prove easier to conduct on a sustained basis and provide more useful data to inform the answer to the crucial question underlying the concern about providing value: what are the sponsor's long-term intentions regarding this group of technical communicators? Will the sponsor continue using them? Will the sponsor expand use of the service, or curtail it?

Limitations of the Study

Several issues limit the results of this study. One is that we used a convenience sample recruited from members of various professional associations. As a result, a response rate as a percentage of invitations cannot be reported. In addition, the small number of participants (just 90) further limits this study. Although demographics of the participants provide insights into the characteristics of the participants and bear a strong similarity to the demographics of the Society for Technical Communication (the principal investigator is a past STC officer and regularly received regular membership statistics while serving on the Board), the population might not be representative of the larger population of technical communication managers and, therefore, not generalizable to them.

That suggests a second limitation of the study. Because of the nature of the sample, we chose not to run inferential statistical tests, like t-tests, on the data.

A third limitation of this study is that the data is self-reported. In other words, the assessments of productivity and effectiveness that participants reported might not reflect their actual practice.

The fourth limitation of the study is the length of the survey. The survey was admittedly long and, because of that, some of the participants might have been affected by survey fatigue. Although attempts were made to address this concern through pilot testing of the instrument, results suggest that it might have continued into the actual survey.

A fifth limitation is time. As this survey was conducted before the economic downturn of 2008 and 2009, the perceptions about the importance of tracking productivity and effectiveness might have changed, as activities might also have.

Even with these limitations, however, as noted in particular sections, the results tend to be consistent with earlier research by others, so the results might still have value.

Measures of Productivity and Effectiveness

Suggestions for Future Research

Given the limitations of this study, at the least, a project that replicates this study under more controlled conditions and with a larger population could indicate the extent to which these findings hold.

But is such a study really needed? Given that research spanning 20 years has produced essentially the same findings—even if it was performed with convenience or purposeful samples rather than random ones—provides a preponderance of evidence that, for the purpose of deciding how to proceed, an additional study is only likely to confirm what is already known. Although purists in quantitative research techniques might differ with our conclusion, we strongly believe that the only benefit of conducting a similar study later would be to assess whether the patterns continue to hold.

Rather, future studies might act on what earlier research has shown and explore in more depth some of the specific findings of this one. One set of effects pertain to the possible impact of organization size, department size, industry, role in setting the budget on the extent to which technical communication managers perform specific activities in evaluating productivity and effectiveness. Most likely, separate studies would be needed to explore each of these effects.

Similarly, this study identified that informal perceptions—communicated through word-of-mouth and external assessments of service quality—play a role in shaping how the bosses of technical communication managers assess the work of these departments. Although previous research and writing about quality has focused on externally verified metrics, perhaps the issue of these boss' perceptions should be explored more formally. Given the lack of a pervasively used metrics, that the majority of technical communication managers indicated that the most important means used by their bosses of assessing the productivity and effectiveness of their staffs was these informal perceptions, and the possibility that assessing these perceptions might ultimately prove more logistically practical than gathering other types of metrics, perhaps future research focus on characterizing the nature of word-of-mouth and service quality assessments with a goal of devising metrics that might be more easily and widely gathered and of greater utility to technical communication managers.

But most significantly, this study found that technical communication managers felt that tracking productivity and effectiveness was, at best, moderately important. Future studies might investigate this perception further, exploring not only why technical communication managers feel this way, but the extent to which their sponsors feel the same.

Acknowledgment

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Forum Moderation as Technical Communication: The Social Web and Employment Opportunities for Technical Communicators

Jordan Frith

Abstract

Purpose: This article examines online help forums as a form of technical communication. The purpose of the article is to explore the similarities between moderators of help forums and technical communicators. The article argues that technical communicators are uniquely suited to step in as "community managers" of companies' official online help forums.

Method: This study reports on qualitative research done with 23 help forum moderators. The researcher used an iterative grounded theory approach to seek out research participants and code the interview data to examine emergent data categories. The research was also supplemented by six months of observation and an extensive memoing process.

Results: The interviews with forum moderators show that help forum moderation requires many of the skills technical communicators already possess. Moderators play an important role in the health of online help forums, and they must be able to work with subject-matter experts, edit content, organize material, create content, and shape the overall tone of the forum.

Conclusion: Many companies now sponsor official help forums, and these companies need community managers to run these sites. The data reported in this study show that technical communicators possess the skills to succeed in these positions and help develop professional online help forums. In conclusion, technical communicators have a strong case to make that they are well positioned to step in as community managers, especially of professionally sponsored online help forums.

Keywords: online help forums, social media, help documentation, technical communication jobs, moderators

Practitioner's Takeaway

- Companies such as Apple, Microsoft, and Home Depot (to name a few) have created professional online help forums that can supplement professionally produced help documentation.
- These forums feature a mix of subject matter-experts and novices who post and answer questions, in effect creating a networked form of help documentation.

- Technical communicators possess the skills necessary to be employed as forum moderators, and "community management" may represent a growth area for the field.

Forum Moderation as Technical Communication

Introduction

How-to guides for thriving in the digital age are filled with discussions of technical communication even though they rarely, if ever, use the term. For example, Howard Rheingold's (2012) *Net Smart: How To Thrive Online* devotes multiple chapters to the topic of finding help information. However, what is notable is that Rheingold and others do not point readers to traditional forms of help (Bellanca, 2010); instead, they urge readers to go online and participate in online help forums to figure out how to accomplish various tasks. While they may not use the term, what these books describe is a fundamental shift in how documentation is produced; many people now rely on networked forms of help documentation as a supplement or replacement for traditional technical documentation.

The growth of online help forums does not mean companies no longer employ technical communicators to produce documentation. Products obviously still ship with instructions and professionally produced online help systems. However, the field of technical communication must recognize that, as Gentle (2009) argues, people increasingly turn to user-generated content when seeking out help. They may be just as likely to Google a problem as they are to consult a manual, and importantly, many of Google's top results for help information come from various online forums. Some technical communication researchers view this shift towards online, amateur help communities negatively. For example, Carliner (2012) believes that online help forums are a form of "contraprofessionalization" that "circumvent paid technical communicators and engage others in preparing technical content for publication" (p. 55). However, this article makes the case that the growth of online help forums can present opportunities for technical communicators. As Gentle (2009) points out, technical communicators can work to position themselves as "community managers" who have the technical and communication skills to properly moderate growing online help forums. A cursory glance for "community managers" on careerbuilder.com returns many position listings, but many of the job ads are targeted towards people with backgrounds in marketing. This article draws from Gentle's work and argues that technical communicators are just as qualified to step in as community managers, particularly in the context of

large, professional help forums such as those sponsored by Home Depot, Apple, Microsoft, and others.

To support my argument, I draw from qualitative work I did with online help forum participants. For my project, I engaged in six months of observation in a variety of online forums, ranging from StackOverflow to a popular online plumbing forum. I also conducted 23 interviews with people who actively participate in online help forums. Of the 23 people I interviewed, 19 moderate at least one online help forum. I focus on the role of forum moderators in this article to show that my data reveals that technical communicators are well-suited to moderate online help forums and act as community managers. Before moving on to my data analysis, I first discuss literature on forums and technical communication and then examine literature on how collaborative sites require some form of structure and moderation. After reviewing literature, I explain my methods and my data analysis and conclude with a discussion of the implications of my data.

The argument set forth in this paper—that forum moderation requires many of the same skills as technical communication—is relevant for both technical communication practitioners and educators. I hope to show that technical communicators are well suited to step in as community managers and also suggest that technical communication educators may want to consider adding a required course on social media to existing curricula.

Online Help Forums and Technical Communication

Online help forums cover a wide variety of topics, ranging from programming languages to home improvement projects. Most of these forums follow a question and answer format where users post questions for members of the community to answer. For example, StackOverflow and Reddit's r/techhelp have thousands of users who post questions about technology. The popular DIY forum has tens of thousands of experts and amateurs who ask and answer questions about home improvement projects.

Technology companies have also created forums in which users can discuss products and turn to the community for help. Apple has a vibrant Apple Support Community, as do both Microsoft and Adobe. In addition, many popular open source projects, such as

Apache, rely mainly on online forums as a source of help documentation. As Lanier (2011) writes,

> P2P online forums typically represent the only user assistance found in OSS systems. They are also becoming a model for commercial software (CS) systems. In fact, many commercial organizations, especially smaller ones (e.g., TechSmith and MediaLab), put their own material resources into product forums. (p. 350)

Importantly, tech companies and open source projects are not the only official company forums. Home Depot and Lowes both have official forums people use to ask and answer questions. Even tool companies such as Caterpillar feature official forums in which people can connect with others who use Caterpillar technologies. While it is impossible to include a full list of companies that have official online help forums, it is important to note that these forums are a growing source for help information that spans multiple industries.

These online help forums are examples of how the Internet and social media have impacted the practice of technical communication. As Gentle (2009) argues, people often go online before checking official documentation, and many searches direct users to forums. These forums become part of what Bleiel (2009) calls "Convergence technical communication," which takes advantage of the capabilities of the social Web to engage users in the content production process. O'Keefe (2009) also identifies forums as an increasingly valuable source for technical documentation. She claims that despite the fact that the popularity of community-generated documentation may seem "uncomfortable and vaguely insulting" (p. 4) to professional writers, 21st century technical communicators should think through how to incorporate social media content in their documentation strategies.

Importantly, Gentle, O'Keefe, and Bleiel do not view the growth of crowd-sourced documentation as necessarily negative for technical communicators. While Carliner (2012) argues that these types of forums "circumvent paid technical communicators," Gentle claims that technical communicators may be ideally suited to work as community managers who moderate and encourage people to participate in these forums. She writes that technical communicators will have to "find the correct value proposition for [their] work

and determine whether [their] role is an enabler of conversation or an instigator of conversation" (p. 69). Berglund and Priestley (2001) also argue that technical communicators can play a valuable role in online help communities "as gatekeeper and moderator for FAQs and formal documentation" (p. 132). As I discuss in more detail in the next section, vibrant online help communities all require some form of moderation. These communities all need moderators who establish community norms, engage members, and encourage participation, and technical communicators can step in as the moderators who make sure the forums run smoothly. As the growth in company-sponsored online help forums show, community management may provide a growth area for technical communicators.

While not directly related to online help forums, a related strand of technical communication research is Mackiewicz's work on similarities between various social media sites and technical communication. Mackiewicz (2010a) examined how online reviewers establish credibility using many of the same techniques as technical writers. She also focused on how volunteer advisors on the site Epinions.com can "take on a role quite similar to that of a technical editor" (Mackiewicz, 2011, p. 423). Her research extends Durack's (1997) earlier work that argued that we need to expand "the range of texts that 'count' as technical writing" (Mackiewicz, 2010b, p. 403). This article has a similar goal and sheds light on the content in amateur help forums as a form of viable technical documentation. I also build on Mackiewicz's observations that social media moderators and reviewers often exhibit many of the same skills as technical communicators, and I use that point to argue that technical communicators may be uniquely suited to manage the growth of professionally sponsored online help forums.

Online Forums and Moderation

Research shows that the design of online forums plays a significant role in encouraging people to participate (Barab, Makinster, Moore, & Cunningham, 2001). This research includes how best to foster trust amongst participants (Rheingold, 2012), how to use economic models to encourage participation (Vassileva, Greer, McCalla, & Deters, 1999), and how to incentivize people to contribute content in peer-to-peer help forums (Jain, Chen, & Parkes, 2014). All of the forum designs

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examined in these studies require moderators to play an active role in shaping conversation and molding community dynamics. In other words, as Barab *et al.* (2001) argue, a successful peer-to-peer help forum is never simply the result of design; instead, forums are sociotechnical environments shaped as much by user practices as technical solutions.

Research has also examined the essential role user-generated online documentation has played in the growth of open source software (Lakhani & von Hippel, 2003). Coleman's (2013) ethnography of hacker culture details the important role documenting software development and providing feedback to participants plays in open source environments like Debian. As Coleman argues, these collaborative communities can often be hostile to outsiders, and moderators play an important role in setting the tone for the community. Once again, her work shows that individual actors play a significant role in how user-generated documentation is disseminated and developed.

Finally there is research that explicitly examines roles moderators play in online forums; however, little of this research specifically looks at online help forums. Instead, scholarship has focused on moderation in political forums (Janssen & Kies, 2005; Wright, 2006; Wright & Street, 2007), feminist forums (Herring, Job-Sluder, Scheckler, & Barab, 2002), and health forums (White & Dorman, 2001). These studies all point to the importance of moderators for managing large forums, regardless of topic. For example, Coleman and Gotze (2001) argue that "mechanisms of moderation and mediation are crucial to the success of many-to-many, asynchronous dialogue" (p. 17), and Herring *et al.* (2002) point out that moderators must be skilled communicators to defuse tension among forum participants. Wright (2006) examines how different moderator roles impact forum participation and found that both "silent moderation" and "mechanical filters" that automatically block certain messages negatively impacted political forum conversation. Wright's conclusion was that successful online forums require active moderators who can guide conversation and set the overall tone.

While the research on online forums cited above shows the importance of moderation, little research specifically looks at popular online help forums. The research also does not examine the specific tasks of forum moderators or the skills people must have to

succeed as moderators. The data discussed below addresses that gap in the literature by examining the main tasks of forum moderators, and I later discuss the links between my data categories and the already existing skills of technical communicators.

Methods

For this project, I first received approval from my University's Institutional Review Board and I then began observing interactions in a variety of forums and participating when possible. Over a six month period, I took notes on interactions in a variety of online help forums including the Google Android forum, Reddit's r/techhelp, StackOverflow, and a forum dedicated to DIY flooring and plumbing projects. I took notes on these observations by noting situations in which moderators intervened during forum discussions and situations in which forum participants seemed to have difficulty communicating help information. I also took notes on different forms of help documentation found in forums, such as the "how to ask a question" pages discussed later.

I also recruited interview participants by posting requests in a variety of forums. I intentionally sought out participants from a range of forums as a form of theoretical sampling. Theoretical sampling is a concept developed in grounded theory approaches to qualitative research and refers to the purposive recruitment of participants (Glaser & Strauss, 1967). I sought out participants who participate frequently on forums and who cover a range of subject areas because I wanted to gain a dense theoretical understanding of help forums in general. At the beginning of the research process, I targeted any forum participant who wanted to participate in my study. However, after coding my initial interviews, my data began to show relevant links between forum moderation and technical communication. After identifying those links, I began specifically targeting forum moderators for interviews. I contacted 26 different forum moderators and received responses from 12 of them. I interviewed these 12 moderators and these participants then referred me to another 7 people who moderate forums. In total, 19 of my 23 research participants had experience moderating online help forums, 20 of the 23 research participants are male, and the participants' ages ranged from 19 to 58 years old. Most of my participants participated in technical forums, though three participants were only active on plumbing

and flooring forums. As a final note, I cannot provide the names of each forum I recruited from because it would risk my participants' confidentiality. Some forums only have one or two moderators, so saying I interviewed the moderator of one of those forums would potentially violate their confidentiality.

I conducted each interview over the phone or on Skype because the participants were not located in my area. The interviews lasted between 30–100 minutes, and I recorded the interviews and had them fully transcribed to allow for more thorough coding. The interviews covered multiple topics related to online help forums, including why people participate, how to incentivize participation, community dynamics, and most importantly for this article, the role moderators play in online help communities. The interviews followed a semi-structured format (Charmaz, 2006), and I began with a general script I followed, but I deviated from the script to ask participants to expand upon certain topics. I also altered the script throughout the research process to take into account interesting data that emerged from earlier interviews.

I drew from grounded theory throughout the entire research process. Grounded theory is likely the most popular approach to social scientific qualitative research (Strauss & Corbin, 1998), and it is a rigorous process that shapes the entire research design (Charmaz, 2006). At its heart, grounded theory is an iterative process that requires researchers to code early interviews, develop categories, and then use that early data to shape later interviews. I coded my early interviews and used that coding to identify interesting areas I focused on in later interviews. These early rounds of coding also shaped the types of theoretical sampling I discussed earlier. For example, as mentioned earlier, I did not set out in my early interviews to focus mainly on people who have experience moderating forums. However, my early interviews began revealing interesting links between moderator practices and technical communication; consequently, I actively sought out forum moderators for my later interviews and took advantage of the emergent nature of grounded theory approaches.

I coded all of my transcripts using the qualitative data analysis software Atlas.Ti, and I went through the data multiple times throughout the research process using a constant comparison method where I constantly refined existing categories, merged categories, and created new ones (Huberman & Miles, 1994). My

iterative coding process allowed me to identify emergent patterns in my data, and I report on the moderation categories in this article. I supplemented my coding with an extensive memoing process in which I defined the codes and began forming conceptual links among my categories. Memoing is a key part of grounded theory coding, and I used my memos to trace and define my categories, identify links between categories, justify why pieces of data fit within certain categories, and explain to myself as the researcher why certain categories should be merged. Finally, I wrote detailed vignettes of each of my participants as a way to maintain a holistic understanding of my participants that can be lost when fracturing interview data into distinct categories (Clarke, 2005).

Results

The data presented below cover categories relating to forum moderation that emerged from my research. Those categories are: (1) Moderators as knowledgeable non-technical experts, (2) Moderators as quality control experts, (3) Moderators as translators, (4) Moderators as information architects, and (5) Moderators as tone-setters. After describing each of these categories and including a few representative quotes from my participants, I then link these categories to my overall argument in the discussion section.

Moderators as Knowledgeable Non-Technical Experts

The online help forum moderators I spoke with came from a variety of backgrounds. Some were experts in the topic they moderated, but some were not. For example, I spoke with a moderator at an online plumbing forum who was not a professional plumber. He enjoyed moderating, and he had recently become the moderator of other forums, including a flooring forum and a computer programming forum, that covered topics with which he was not particularly familiar. I also spoke with moderators of computer programming forums who, though they knew programming basics, did not have the level of expertise of many of the people who actively answered forum questions.

My participants repeatedly stressed that moderators' most important skill was not technical knowledge. They could moderate a flooring forum without being professional floorers; they could moderate a technical help forum without being IT experts. Instead, participants reported that communication skills were

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more important than technical knowledge, and multiple participants were asked to moderate forums outside their area of expertise mainly because they showed solid communication skills, as the quote below suggests:

> Interviewer: So as a global moderator, is it important for you to be an expert in the forum topic?
>
> Participant: Oh, no. Not at all. It's really more about making sure people are following the forum rules. You know, we can take care of spam posts if they see them, we can have a little more ability to delete things or move things around to the appropriate places, we can step in if a member's being rude or somebody's breaking rules, they can step in and enforce the rules as we see it. It doesn't hurt to know a lot, but it isn't necessary, and I have actually had friends from other forums ask me to help out as moderator because they saw I handled things well.

However, some technical knowledge is often important for moderating forums. The following categories all examine different roles help forum moderators play, and these different categories implicitly relate back to moderators' role as knowledgeable non-technical experts. Each task described below can be performed even if a moderator is not a subject-matter expert, but these roles all require moderators to be willing to learn new material and familiarize themselves with the topic being discussed.

Moderators as Quality Control Experts

One of the main tasks of forum moderators is to maintain the quality of forum posts. This task mostly concerns working to combat spam. Every single moderator I spoke with told me that spam is a problem in forums, and moderators must be able to spot spam, delete it, and ban the users:

> Participant: You know, someone will pay $100 to a foreign phone company to just blast the sites with spam. And we go in there and try to knock it off. And those, we don't even second guess it. We just, if the IP address comes through India and the hyperlinks in their questions, then we just ban them. 'Cause what they do is they get money by clicking. If you click on the hyperlink, and they'll get a penny a piece. So, you know, say "I got a great plumbing site.

Click here." If you click on it, it's Joe Blow's Plumber from Indiana and they get paid a penny every time you click on it. So I'm not going to allow them to make money by spamming our sites.

Identifying spam, however, is not always easy. It requires practice and a certain amount of technical knowledge. As the quote above points out, one of the main ways in which moderators identify spam is through IP addresses, meaning many moderators had to have a basic knowledge of how to understand IP address information. Moderators also had to know enough about the forum topic to be able to identify the difference between spam and a poorly worded post that might get caught in a spam filter. They also had to read closely enough to tell the difference between someone posting useful information and someone only interested in getting people to go to his or her Web site.

The prevalence of spam varied from forum to forum. Basically the more popular the forum, the more spam it got. Moderators were all responsible for controlling spam, and in some cases the task could be quite complicated. The most extreme example that arose in my interviews was a moderator who focused solely on spam. He moderated over twenty forums and called himself the "spam cop." Other moderators would reach out to him if their spam problems became serious, and he would go in and clean up the forum and ban people from posting links to certain Web sites. He even created a basic algorithm that could detect likely spammers by comparing their post count to the types of Web sites they shared. While deleting spam may seem to be a monotonous, straightforward task, my data showed that it can require an attention to detail, language, and content that is not dissimilar from the content management practices of skilled editors.

Moderators as Translators

Most of the people who post to online help forums are not professional writers. They tend to be experts in a certain area and occasionally lack the communication skills necessary to clearly respond to questions. The struggle to communicate effectively on forums can be particularly pronounced when an expert user responds to a novice's query. For example, two participants I spoke with, one of whom moderates an Android programming forum and one who moderates a Microsoft forum, told me that experts often responded

to questions by using jargon or explaining things in a way that made little sense to the person requesting help, especially when the original poster did not have advanced subject-area knowledge. My interviews suggest the same communication problems arise regardless of the topic of the help forum.

My participants also told me that one of their roles as moderator was often to step in as "translators" to help more beginner forum participants understand complicated material, which included responding to a more technical response to clarify it in an accessible way. This form of translation not only required moderators to translate from an expert to a novice, it also required tact so they did not seem to be belittling the more expert poster's valuable advice:

> Participant: There's too much volume now for me to go through every post like I used to. But certainly, some people are better at explaining things for their audience than others. I see explanations that while correct were not clear. I've seen some that were clear but incorrect. I've seen ones that were correct and clear but were very much going to be over their head of someone who had just started their programming. Sometimes I have to just jump in and clarify a little bit without offending everyone. Not everyone is a fantastic communicator; that's just not their skillset.

Moderators also acted as language specialists in guiding beginner users on how to ask questions. Regardless of the subject matter, my participants told me the most important skill a forum participant can have is the ability to properly ask a question. Question are often overly vague and do not contain the necessary information to provide an adequate response. This came up most frequently in my interviews with people who moderate computer programming and IT forums. People asked questions about installing software or writing lines of code that did not provide enough background information. Moderators often stepped in to ask them to include the necessary information, and moderators also created sidebars participants could read that gave them explicit guidelines for how to properly ask a question (see Reddit's Learn Programming subreddit for an example). These guidelines worked as a de-facto style guide for forum posting and attempted to standardize content to improve the flow of the forum,

and I cover the shaping of a forum's content in more detail in the next section.

Moderator as Information Architects

Most of the people I spoke with moderated forums that were required to follow a certain design. For example, all subreddits are constrained by Reddit's overall interface, every DIY subforum had to mirror the overall site, and other forums are constrained by the site building template they use (for example, vBulletin). However, moderators worked within those constraints to create and organize material to make the forums more usable.

The most frequent example of moderators creating content for forums came in the form of FAQ sections. Many of the questions posted to forums cover similar material, whether the topic is laying a tile floor or building a computer hard drive. Consequently, some moderators I interviewed created an FAQ people can consult before asking their question. As multiple people told me, most people do not bother to consult the FAQ before posting, but the FAQ can still serve a useful purpose by providing a document other participants can direct the original poster to rather than answer the same question over and over again.

Forum moderators are also able to create sets of guidelines that can help people ask questions, which I discussed in the previous section. One of the difficulties beginners face when asking questions on a forum is asking questions in ways that make sense so moderators can create a guide to help beginner users:

> Participant: The necessary details are commonly lacking in questions on technical forums. So I created posting guidelines try to address that, say, "Here's how to get the best response from us. And that's to provide us with all the information that you know, the things that you've tried, things maybe you haven't gotten around to yet or the need results thereof." Yeah, so that's what the posting guidelines are for, to try and address the common shortcomings in technical forums.

Finally, moderators can also play a role in organizing content in online help forums, especially on larger sites that have multiple subforums. The Android help forum, for example, has over 50 subforums devoted to different Android phones and

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different programming questions. A flooring forum I researched looked much the same, with different sections devoted to general questions, laminate flooring, carpet, subflooring, professional advice, and various types of tile. The moderator is often responsible for identifying these various categories of content and creating the subforums so that participants can focus on their areas of knowledge rather than wading through every single posted question. Moderators also are often tasked with moving questions that may be posted to the wrong sections. So if someone posted a general flooring question in a laminate flooring section, the moderator would move it to the general section where it is more likely to be answered. In this way, the moderator plays a role in shaping the organization of the entire forum, which is important on forums that cover multiple help topics.

Moderators as Tone-Setters

Social dynamics vary from forum to forum. Some help forums are welcoming to beginners; others foster a dynamic that discourages beginners from participating. Some forums encourage posters to focus solely on the forum's topics; others encourage a more open community approach. The moderator often plays a major role in both setting the tone of the forum and establishing what is and is not appropriate:

> Participant: Moderators absolutely do set the tone for how conversations are handled in there, and, you know, are involved with the administrative staff in setting the rules for that forum. So that kind of controls the conversations you hold there. As you may see in some forums, even technical ones are very broadly focused. They have conversations that always seem to diverge; others are very focused, very spot-on. And when a conversation is over with, that's it. Move on to the next thing. As the moderator, I do a lot to kind of direct how the forum works.

Moderators also tend to write the rules for the forum, and it is up to them how to enforce the rules. Some people told me they take a "hands off" approach, only stepping in when someone obviously crosses a line and makes threats or starts flaming. Other moderators take a more active role in shaping help forum dynamics

by messaging people whenever they are rude or critical and, in effect, making it clear to participants that they must be polite:

> Participant: That's the job for moderators to read that and go, "there's no business for that." And that's when you send them a private message saying, "Hey, knock it off. If don't you have any good things to say, then say nothing at all." And that's what makes a good or bad forum. And I've experienced it myself.

An important point to make is that not all moderators or forum participants *want* their online help forum to be welcoming and polite. One of the ways forums can be exclusionary is by promoting a certain level of expertise and ostracizing beginner users. Some of my participants described certain online help forums they felt intentionally promote a less welcoming environment as a way to keep less experienced users from participating. For example, a participant told me that on the forum StackOverflow people often posted responses like "we're not going to do your homework. Google it and you'll figure it out." The same participant told me that the subreddit r/techhelp, on the other hand, was welcoming to beginner users and that kind of response would not be accepted by the moderators.

Discussion

When I began coding my early interviews with forum participants, I did not focus on forum moderation. I was initially more interested in exploring why people participate and what can be done to encourage participation. However, in one of the first of many attempts to code my early interviews, I realized the categories emerging from my data analysis concerning forum moderation closely resembled the roles many technical communicators play in the workplace. I then changed the focus of my project, which is one of the strengths of the emergent nature of grounded theory approaches, and recruited interview participants who had experience moderating forums. I want to conclude here by explicitly linking the data categories discussed above to the field of technical communication.

The first category explained that many forum moderators are not necessarily subject matter experts. In many cases, strong communication and organization

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skills were more important to successful moderation than an expert-level grasp of the subject material. However, the moderators did have to be comfortable with familiarizing themselves with new material and learning enough to make informed decisions about content. These behaviors closely resemble the activities of technical communicators, who are often required to work with subject-matter experts to create material (Lee & Mehlenbacher, 2000). The expertise technical communicators bring to a project often focuses on their communication skills, but they often must be able to familiarize themselves with technical material to create adequate content. Technical communicators already have experience working with subject-matter experts and communicating material clearly, so they will be well-suited to step in as community managers on professional forum sites even if they do not have expertise in that area.

Technical communicators also have extensive experience with the next two categories that emerged from my data analysis: moderators as quality control experts and moderators as translators. As I explained, one of the major tasks for most forum moderators is ensuring that a forum is not overrun with spam. Fighting spam can be more complicated than it might seem. Moderators often have to go through the spam filter to make sure viable, though often poorly worded, questions are not being marked as spam, and doing so requires close reading and a familiarity with the types of questions being posted. Moderators also must police the forums and recognize certain posts that may violate community guidelines. The moderator's role as quality control expert can require many of the same attention-to-detail skills that are a hallmark of successful technical communication, particularly technical editing.

Ensuring the quality of forum content can also require moderators to translate information among multiple audiences, as shown in the translator category. Help forums often feature experts and amateurs, which can lead to communication problems when experts have trouble writing posts at an appropriate knowledge level. Multiple people I interviewed told me they stepped in as moderators to "translate" information to the amateur audiences, which clearly shows a link between forum moderation and technical communication. As my research showed, managing the dynamic between expert and amateur audience is key to establishing a vibrant help community; as professionals who translate information between subject matter experts and the

public every day, technical communicators have the professional skills to manage this complicated forum dynamic. Technical communicators also have experience working with subject matter experts and suggesting changes in a tactful way (Mackiewicz & Riley, 2003), which earlier research showed is necessary for diffusing tension in online forums (Herring et al., 2002).

Translating between experts and novices is not the only thing moderators can do to manage tension between those asking and answering forum questions. Moderators also often play a role as the information architects of the forum. Most forums follow a prescribed structure that limits changes administrators and moderators can make; however, within these constraints, moderators can add content and organize content to improve help forums. The most frequent content they create is posting guidelines, which is fairly similar to designing an overall style guide posters are expected to follow. But my research also supported Bleiel's (2009) point that technical communicators' have the skills to create valuable forum FAQs and guides on how to ask questions, and both these types of documents require content creation skills and an ability to write to diverse audiences. Moderators also must be able to organize content by creating new subforums when appropriate and moving posts to the correct subforums. In fact, one moderator told me that improving the architecture of the forum he moderates helped almost double the number of new posts over a six month period.

All these different categories show the similarities between the skills of forum moderators and technical communicators. The final category—moderator as tone-setter—possibly shows the link most explicitly. The moderators I interviewed help dictate the overall feel and dynamic of forum participation (Wright & Street, 2007). They choose what to allow and not allow and craft the overall "voice" the forum presents to new users, just as a technical communicator may work with subject matter experts to craft the "voice" of a large report or grant application. As communication experts, technical communicators are prepared to understand how to manage the dynamics of help forums to present a certain image to new users. This skill can be particularly useful in the context of professional help forums, which may be required to present a more refined image and strike a different tone than an amateur online help forum. As more people continue to turn to the Internet for help information, the

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dynamics of these professional forums will only become more important. My data suggests that technical communicators have the skills necessary to succeed as community managers for many of the professional online help forums that have become an increasingly crucial part of the informational landscape.

Conclusion and Implications

Technical communication research features many examples of how social media have impacted the profession (Ferro & Zachry, 2013; Hea, 2013). One of those impacts is in the area of help information. Social media sites ranging from Wikihow to YouTube have provided people with venues for seeking out help. Online help forums are also a major source people use to access help documentation, and guides for thriving in the digital age often point readers to the importance of participating in and using help forums (Rheingold, 2012).

The ability to find amateur help forums online has not replaced the need for professionally produced documentation, and many technical communicators still write manuals and design help systems. However, Carliner (2012) warns that some companies have begun to cut the resources they devote to documentation and instead rely on amateur users to produce this information. This move away from professionally produced documentation will in some cases hurt technical communicators. However, the growth of online help forums can also present new opportunities for the profession. As Gentle (2009) argues, technical communicators may be able to step in as "community managers" ready to help develop and run official help forums such as the Apple, Microsoft, Adobe, and Home Depot forums (to name only a few). This article provided support for Gentle's point by arguing that forum moderation requires many of the skills already possessed by technical communicators.

The argument set forth in this article has implications for both technical communication practitioners and technical communication educators. For professionals, I hope to have shown that technical communicators already have to skills necessary to work as moderators of online help forums. While many community manager positions target people with marketing degrees, technical communicators can make a persuasive case that they have the technical and rhetorical skills to manage large communities, particularly communities focused on producing help information. Most of these forums feature participants of various levels of expertise, and technical communicators are already familiar with how to work with subject matter experts to communicate messages to novice users. Technical communicators also have the attention to detail necessary to combat spam and the writing and organizational skills to contribute to a thriving professional forum community.

This implications of this article also suggest that educators should consider how best to prepare students for the contemporary informational landscape, and technical communication programs may want to consider adding courses that specifically focus on how social and digital media have impacted the profession. These courses could help students compete with students from other majors for positions as community managers and forum moderators.

In conclusion, I hope that this article has persuasively made the case that technical communicators are uniquely suited to step in to a variety of social media management positions. Existing jobs and existing professional responsibilities will not disappear. Professionals will continue to develop help documentation of various types. However, the growth of online help forums and the creation of professionally sponsored forums have impacted how people seek out help and will continue to do so. Our profession has a strong case to make that we are prepared to adjust to these changes and adapt to 21st century online help environments.

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Networked Rhetoric: iFixit and the Social Impact of Knowledge Work

Guiseppe Getto, Nathan Franklin, and Sheryl Ruszkiewicz

Abstract

Purpose: Technical communication scholars have shifted to considering the role of communication specialists as knowledge workers within larger networks, such as work groups, organizations, and institutions. From our interest in this trend as well as our aims to bridge workplace and classroom contexts, we conducted a case study of the networked interactions of key actors involved in iFixit's Technical Writing Project, as enacted in a technical writing classroom at a state university.

Method: From Latour's definition of an actor as a component of a network capable of impacting other components, we conducted a qualitative case study examining the interactions of technical writers, technical writing students, technological devices, tools, and wiki technologies during students' completion of the Technical Writing Project. In particular, we examined how these actors exerted rhetorical impacts on one other during students' writing processes.

Results: The results of our study were that the Technical Writing Project asked students to assemble a complex rhetorical situation that involved technical knowledge-making as well as assembling both human and nonhuman actors to create high-quality documentation. Further, this documentation was created in a situation strongly influenced by both workplace realities and the interactions enabled by an open source wiki that allows for contributions by interested Internet users.

Conclusion: We believe our study on the reciprocal impacts of both human and nonhuman actors in the context of a learning project that spans workplace and classroom context calls for new models of rhetoric that better account for networked knowledge-making.

Keywords: technical writing, knowledge work, network, rhetoric, case study. service-learning

Practitioner's Takeaway

- Emerging technologies such as open-source documentation platforms are making possible new partnerships between the workplace and the classroom. Such partnerships hold the promise of producing better-prepared technical communicators, as well as providing technical communicators with the opportunity to help train the next generation.

- In order for academic-industry partnerships to be fostered, collaborative networks must be formed between technical communication scholars and technical communication practitioners, networks in which all stakeholders have the opportunity to influence one another in positive ways.

- Such collaborative networks challenge existing rhetorical models for teaching, research, and preparing documentation, and thus require new models that take into account the growing complexity of knowledge work, especially when it involves emerging technologies.

- iFixit's Technical Writing Project provides evidence that academic-industry partnerships can provide fruitful, challenging, and complex opportunities for knowledge work that has positive social impacts beyond the classroom.

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Introduction

While researching emerging technologies used to bridge workplace and educational contexts over the past several years, two of the authors of this article (Guiseppe and Sheryl) were approached by the technical writing firm iFixit to engage in a service-learning initiative called the Technical Writing Project, which centers on the creation of free repair manuals for technological devices (http://edu.ifixit.com/). Designed to bolster participation in iFixit's overall project of creating the largest free online repair manual (http://ifixit.com/), the curriculum supporting this service-learning initiative has grown into a large network of college students and instructors across the country who receive free toolkits, as well as free devices (for example, cell phones, handheld GPS, smartphones, and so forth), from iFixit's large stockpile of recommissioned e-waste, in return for creating wiki-based repair guides under the tutelage of iFixit technical writers.

While developing curriculum to support this project within our respective courses and programs, we became increasingly interested in the ways in which iFixit has fostered a network of college students, teachers, and repairers of technological devices from a wide variety of industries. We began to wonder, in other words, about the relationships between components of the network surrounding iFixit's wiki—one that includes technical writers, students, teachers, wiki technologies, devices, and toolkits. While considering these issues, Guiseppe also began a research relationship with iFixit, a relationship that would culminate in a case study of the Technical Writing Project as enacted in his own classroom.

Grounded in a series of interviews with iFixit's technical writing staff, a rhetorical analysis of process documents exchanged between technical writing students and iFixit staff, and a rhetorical analysis of iFixit's wiki itself, his central research questions were:

- What are the interactions among key actors involved with a technical documentation project utilizing an open source wiki?
- What bearing might these impacts have, if any, on models of rhetoric used by researchers and teachers of technical communication?

Guiseppe's main impetus for researching iFixit's wiki, in other words, was to assess the extent to which the network of people and technologies surrounding the wiki is worth considering from a rhetorical standpoint. He wondered if this network might hold implications for research on the relationship between humans, technologies, and rhetoric.

We think his findings, along with our collective experiences engaging with iFixit's Technical Writing Project, could inform the ways researchers and teachers of technical communication think about emerging technologies like the oManual, the open source documentation system upon which iFixit's wiki runs (http://omanual.org/). And we think that these findings could inform the way researchers and teachers think about the networks afforded by such technologies. We begin our exploration of these issues with a more thorough introduction to the theoretical framework behind our case study of the Technical Writing Project. We then articulate the methods we employed in this case study into the relationships of various actors within iFixit's network, and the findings these methods rendered. Our goal throughout this report of research findings and analysis of extant literature will be to encourage scholars and professionals interested in these issues to reconsider some of the ways in which their professional activities are being impacted by, and are thus impacting, the development of emerging technologies that are in turn changing the ways we think about rhetoric.

Theoretical Framework: Speculative Realism, Knowledge Work, and Networked Rhetoric

As myriad recent publications attest, an increasing amount of technical communication scholars have shifted to considering the role of communication specialists as knowledge workers within larger networks, such as work groups, organizations, and institutions (Bay, 2010; Grabill, 2007; Johnson-Eilola, 2005; McNely, 2011; Slattery, 2007; Spinuzzi, 2007; Spinuzzi, 2008). This shift builds on conversations from related disciplines like engineering, applied psychology, and information technology (IT) that go back several decades and that attempt to theorize socio-technical assemblages, or networks of interconnected knowledge workers that are mediated by technology and technical

knowledge-making (Cummings, 1986; Davis, 1982; Fox, 1995; Geels & Schot, 2007; Haavik, 2011; Molleman & Broekhuis, 2001; Nierderer & van Dijk, 2010). Many technology-driven workplaces (such as technical writing firms, software development firms, and Web design firms), for instance, now contain such numerous components as a wide variety of Information and Communication Technologies (ICTs); widely divergent forms of technical documentation; and ad hoc groups of writers, developers, interns, supervisors, and quality assurance teams (Slattery, 2007; Spinuzzi, 2009; Whittemore 2007).

Less attention has been paid to how components of networks such as these exert rhetorical impacts on one other. By "rhetorical impacts" we mean *ways in which people, technologies, and other components of networks reciprocally influence the actions of one another.* Technical communicators frequently employ technologies like content management systems to collaboratively produce written content for publication and delivery to a variety of audiences, for example. Though we know this is the case and have a variety of models for managing people, technologies, and workflow (for example, Bradley & McDonald, 2011; Hackos, 2007; Hart-Davidson et al., 2008; Hinchcliffe & Kim, 2012; Morgan, 2012), these approaches have not been codified into contemporary rhetorical models usable by researchers and teachers of technical communication who are interested in bridging educational and workplace contexts.

To begin to develop such a rhetorical model, we framed our understanding of iFixit's Technical Writing Project by drawing on socio-technical assemblage theory, which considers the ways in which knowledge workers utilize technologies to develop complex relationships with one another to accomplish work. Beginning in the 1980s, researchers of socio-technical assemblages, as Davis (1982) and Cummings (1986) pointed out, focused on the transition from an industrial economy based on mechanized production to a service economy based on leveraging technical systems for the purposes of continual learning and knowledge management. More recently, a split has appeared between structuralist approaches conceived of as empirical, ready-to-hand frameworks for studying socio-technical assemblages (for example, Geels & Schot, 2007) and post-structuralist approaches, some of the latter even drawing on Latourian conceptions of human and nonhuman relations within networks (for example, Haavik, 2011).

Our study of the network surrounding a technical writing wiki would definitely fall within the latter camp, as we attempted to understand this network from the ground up as a series of interactions, not through a ready-to-hand framework. At the same time, we wish to extend existing theory to conceive of the complex interactions among actors within networks as fundamentally rhetorical.

We also draw on technical communication scholarship on knowledge work within groups, organizations, and institutions (Bay, 2010; Grabill, 2007; Johnson-Eilola, 2005; McNely, 2011; Slattery, 2007; Spinuzzi, 2007, 2008). Our main takeaway from this literature, to quote Spinuzzi (2007), is that knowledge work helps networks "hold together and form dense interconnections among and across work activities that have traditionally been separated by temporal, spatial, or disciplinary boundaries" (p. 268). Other important precedents are methods developed from Latourian concepts, such as Actor Network Theory (Hart-Davidson et al., 2008; Johnson-Eilola, 2005; Latour, 2005; Spinuzzi, 2008). This body of work has provided empirical justification for the concept that all components of networks are actors—a concept we explore more below—and thus has provided a necessary groundwork from which to envision the rhetorical impacts actors within networks have on one another.

With this lens in mind, we hoped to develop an understanding of iFixit's Technical Writing Project as a network that links human action to nonhuman action, and that sees this linkage as potentially rhetorical. This understanding problematizes the modernist project of cleanly separating cultural objects from the objects of the natural sciences, as Latour (1993) would have it. Instead of sterilized poles of knowledge (that is, the cultural and the natural), Latour examined how networks are made up of what he has called "quasi-objects," which are defined as mixtures of actors that make it difficult to pinpoint exactly where the natural and the cultural start and end respectively (p. 55). Latour's work has thus made legible the idea, echoed by Graham Harman (2009), that "[t]here are only actors," meaning that all components of networks (that is, people, technologies, documents, and so forth) have the potential to impact other components in complex ways (p. 63). To be considered an actor for Latour (2005), in fact, means being able to "translate, transform, distort, and modify"

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other actors (p. 39). Further, actors come in all shapes and sizes (for example, both human and nonhuman).

In the wake of the last decade, thinkers of this persuasion have come to be known by some as "speculative realists" to indicate their acknowledgement of both the role of human perception and the impacts of nonhuman actors in research and theory-building (Bennett, 2010; DeLanda, 2013; Harman, 2002, 2005, and 2009). In a similar vein, Thomas Rickert (2013) has recast rhetoric as irreducible to human intent and action. Specifically, he recently contended that "rhetoric cannot be reduced to the intent—deliberate or posited—to persuade, for we have to include the larger background, including our activity against which the particular assemblage of elements comes to be seen as suasive" (p. 160). For Rickert, including "the larger background," or the networks within which rhetors operate, is essential because rhetoric is intimately tethered to material being and is therefore ontological (based in materiality), as opposed to being solely epistemological (based in knowledge-making) (p. 162).

We follow this vein below to construct a case study of both material means and knowledge-making within iFixit's Technical Writing Project, a case study that acknowledges the networked interactions of key actors we encountered, including technical writers, technical writing students, technological devices, tools, and wiki technologies. In particular, we examine how these actors exerted rhetorical impacts on one another, or how the people, technologies, and other components of the Technical Writing Project we observed appeared to reciprocally influence the actions of one another. We begin this discussion by detailing the research methods we employed to produce these findings.

Method

Research Sites and Participants

Our study was conducted at two main sites: online via iFixit's main wiki interface (http://ifixit.com) and via interviews conducted over videoconferencing software, and in a face-to-face technical writing classroom at a four-year state university. Our goal was to understand how several different kinds of actors rhetorically impacted one another within the network surrounding the Technical Writing Project. Because the goal of the Technical Writing Project is primarily educational, and because Guiseppe was in his second semester of using the project as a final assignment in his Technical Writing

class, he agreed to have student participants recruited from his class. At the same time, we began a rhetorical analysis of all online documentation and technologies clearly linked to the Technical Writing Project. Because we wanted to be certain we understood the goals of the iFixit technical writers who created this project, we also recruited participants from the six technical writers that iFixit employs, of which three agreed to participate.

The Technical Writing Project (http://edu.ifixit.com/) was designed as a flexibly-structured curriculum for use by technical writing instructors who wish to teach the art of documentation in a hands-on manner. This is accomplished by inviting students to document methods for repairing a particular technological device, such as a cell phone, smartphone, or handheld GPS. It is also intended as an introduction to repair for anyone, student or otherwise, who wishes to contribute to iFixit's large catalogue of free, open source, wiki-based repair documentation (http://ifixit.com). The Technical Writing Project is scaffolded mainly by a "Student Roadmap," which contains "Milestones," or descriptions of best practices for each stage of the Project:

- *Getting Started*: Provides various resources for getting started on the Project, including an instructional video on the Project, the environmental mission behind the Project, advice on how to choose a device to create documentation for, a guide for creating a free account within iFixit's wiki, and a checklist of necessary supplies.
- *Milestone 1*: Provides a guide to the creation of a "Troubleshooting Page," which "helps users diagnose what is wrong with their device and points them to the correct repair guides."
- *Milestone 2*: Provides a guide to the creation of a "Device Page," or a kind of homepage for the device being documented, which hosts all the information for that device in an organized manner.
- *Milestone 3*: Provides a guide to photographing the stages of repair and creating one or more "Repair Guides," which are intended as step-by-step instructions to guide users through a specific repair process.
- *Milestone 4*: Provides a guide to usability testing and peer reviewing the rough drafts of completed guides, defined as assemblages of the three genres mentioned above: a Troubleshooting Page, a Device Page, and one or more Repair Guides.

The Milestones are intended less as linear steps for completing the Project, and more as benchmarks for instructors to use to guide students, and for use by students who wish to guide themselves, though checklists of what should be accomplished at each Milestone are included. At any time, students engaged in the Technical Writing Project also have the option to submit their in-progress documentation to iFixit technical writers for review, or to ask any questions they may have about their developing documentation. Guiseppe, as an instructor in the program, was additionally guided by Brittany McCrigler, one of iFixit's technical writers who is also their Director of Education Services and whose job it is to manage educational initiatives, as well as to recruit, advise, and ship devices and toolkits to instructors who wish to participate in the Project.

To capture rhetorical impacts among various actors engaged in a heavily networked project to create repair documentation, we designed a qualitative case study (Miles & Huberman, 1994; Stake, 1995 and 2000; Yin, 2009) of several actors engaged in the Technical Writing Project. These actors included two student teams (of three students each) engaged in the Technical Writing Project as a final assignment for completion of Guiseppe's Technical Writing class, the devices students documented, the tools and technologies students used during their work, the iFixit technical writers who guided the students, and all documents produced along the way. In this article we present a case study of some of the rhetorical impacts we observed among these actors, specifically impacts involving reciprocal influence among the people, tools, and technologies associated with the Technical Writing Project.

Researcher Role(s)

To compensate for the complexity of our case study, we negotiated appropriate moments of data collection, as well as modes of data to collect, with participants. Beyond best practices in teacher research, such as those articulated by Ray (1993), this collaborative approach also stems from best practices in critical ethnographies of writing, such as those articulated by Cushman and Monberg (1998), Horner (2002), and Brown and Dobrin (2004). Encouraging researchers to focus on collaboration, reflexivity, and reciprocity with participants, these thinkers also emphasized how material conditions impact the researcher-participant relationship and, as a result, the usefulness of the knowledge derived from a given study.

Our guidelines for data collection and analysis were thus wrought through rhetorical knowledge-making with participants, as Ray (1993) would have it, because we thought this was the best way to understand the actors we were researching within the specific, material conditions of the Technical Writing Project (p. 146). Because Guiseppe had power over student participants, for instance, after attaining IRB approval for the project, he documented informed consent via a student research assistant who wasn't part of the class, and asked this RA to let him know which student teams were able to be researched, after he had already assigned individual students to teams, all to reduce the risk of coercion.

He also documented class policies indicating that nothing observed during research could affect student grades, and was also careful to work with students' schedules as though students were any other kind of participant. He also reminded student participants that his collection of writing process drafts and his observations of their work with iFixit were entirely optional and dependent on their allowing him into their composing lives beyond the classroom. This courtesy was also extended to iFixit technical writers, as we vetted key moments and methods of data collection with them, such as when we gathered screenshots of their wiki. We wanted to make sure that the screens we captured were the same ones they used themselves when creating repair guides. Through this investigation, we learned that there was a behind-the-scenes moderation panel only visible to technical writing staff and were provided screenshots of this panel for our analysis.

We would also argue that this collaborative spirit was extended to nonhuman participants. A key initial actor in our study was Zotero (http://www.zotero.org/), an application for downloading and preserving Web-based data in its original form. At first appearance, Zotero is a Web researcher's best friend as it allows researchers to download and catalogue every component of a Web site in its original form (for example, image, link, page layout, and so forth). For whatever reason, however, iFixit's wiki interface did not appreciate Zotero's attempted intrusion into its system, and our initial attempts to download the entire interface into a Zotero catalogue (called a "library") resulted in a dizzying output of over one thousand, three hundred digital objects, which

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ranged from photographs to icons to hyperlinks to text, all "catalogued" in no discernible order. We saw this as a key act of communication by iFixit's wiki indicating that Zotero was not an appropriate tool for archiving its interface, and decided instead to utilize the much more low-tech (but time-consuming) option of moving through the interface and capturing each screen view.

Data Sources and Procedures

Our unit of study (Merriam, 1998, p. 27; Stake, 2000, p. 436) was the interactions of various actors within an instance of the Technical Writing Project, as enacted in Guiseppe's face-to-face Technical Writing classroom. In developing this case study, we drew on qualitative case study (Miles & Huberman, 1994; Stake, 1995 and 2000; Yin, 2009) research procedures and methods. Over the course of a three-credit-hour semester, Guiseppe interviewed three iFixit Technical Writers who serve as mentors for the Project, collected screenshots of the wiki interface students used to create documentation through the Project, collected all written documents that two teams of three students each created for the Project, and kept a teaching

journal of observations of the two teams of students. During the last five weeks of Guiseppe's Technical Writing class, all work in the class was devoted to the Technical Writing Project, which was assigned as a final project for all students in the class, all of whom were also apprised that this would be the case at the beginning of the semester. During this period, Guiseppe collected several forms of qualitative data (see Table 1).

Data Analysis

After data collection was complete, Guiseppe began analysis, with Nathan and Sheryl assisting with overall interpretive themes, though neither dealt with the raw data directly. Our first unit of analysis was the "actor," which we defined, following Latour (2005), as a component of the network surrounding the Technical Writing Project that exhibited the ability to directly influence the behaviors of one or more other components, or to "translate, transform, distort, and modify" the behavior of other components (p. 39). We thus analyzed the following components of the Technical Writing Project for their potential influence on other components:

Table 1. Data Sources and Their Use in the Study

Data source	Use in the study
Eighty-six minutes of initial, video-recorded interviews with three iFixit technical writers Eleven follow-up interviews (nine over e-mail and two in-person) with two of them—Miroslav Djuric, iFixit's Chief Information Architect, and Brittany McCrigler, Director of Education Services (five follow-ups were with the former, six with the latter)	Used to understand some of the organizational context behind the Technical Writing Project, including reasons for its creation, and the technical writers' work to maintain the wiki technology for the Project and to help students create documentation
Eighty-three screenshots of iFixit's wiki Interface	Used to understand the affordances of the user interface used by students to create documentation, and the one used by the technical writers for quality assurance
Twelve e-mails (seven from students in Team One and five from Team Two) and two Web pages composed within iFixit's wiki, includingattendant repair guides and final project coverletters from individual students	Used to understand students' writing processes for completing their documentation, including in-process interactions with the technical writers
Fifteen observational journal entries written by Guiseppe, one for each day of class spent on the Project	Used to record in-class student responses to the wiki technologies and tools they used for the Project, as well as their reactions to the feedback they received from the technicalwriters

- *students* enrolled in Guiseppe's Technical Writing class;
- *technical writers* responsible for mentoring students through The Technical Writing Project;
- *technological devices,* both those used by students during their repair process (for example, smartphones used to take pictures for their documentation), and the devices students were creating repair documentation for;
- *wiki technologies,* specifically those employed by iFixit to create an online repository of free repair documentation;
- and *tools,* specifically those included in the iFixit toolkit that instructors receive as part of their participation in the Technical Writing Project.

We analyzed these actors (as evident in the video recordings, screenshots, written documents, and Guiseppe's observational notes) by conceptualizing them as part of the same network, a network that afforded "rhetorical impacts" between these various actors.

By "rhetorical impacts" we mean, following Latour (2005) and Rickert (2013), ways in which the people, technologies, and tools associated with the Technical Writing Project appeared to reciprocally influence the

actions of one another. We thus identified the actors associated with our case study that appeared to have the most influence on other actors, which we ascertained through triangulating the impacts of each actor on every other actor (see Table 2). Specifically, using qualitative research coding procedures (Merriam, 1998; Strauss & Corbin, 1990), we coded each actor for interactions we observed between it and other actors, and for affordances each actor appeared to perceive within other actors, and thus attempted to articulate rhetorical impacts *between* actors (see Table 2). By "affordances," we mean what Lee (2007), following several others, has called "perceived affordances," a term grounded in the belief that "text-making practices are not determined by what the resources naturally offer but are shaped by how people [and, we would add, any type of actor] perceive what various representational resources can or cannot do for them" (p. 227). We thus attempted to understand each actor in terms of how it interacted with other actors within the network of the Technical Writing Project on both an epistemological (knowledge-making) and ontological (material) level.

To further illustrate this complex analytic procedure, we here provide a detailed example of how we coded one student from Team One as an actor

Table 2. Summary Example of Coding Scheme for a Single Actor

Actor	Interactions	Affordances	Rhetorical impacts
Students	Requested feedback, technical assistance, and help from technical writers	Perceived technical writers as "experienced" writers who understood the real world"	Worked to understand what effective documentation was, and how to mobilize available means to create such documentation
	Used devices both as objects of repair documentation and as tools to aid the creation of documentation	Perceived devices as objects other people owned that had broken and were in need of repair	Worked to understand what about a given device needed to be documented to ensure effective repair documentation was created
	Used wiki technologies as a writing platform for composing their documentation	Perceived wiki technologies as "portals" between their documentation and Internet users	Worked to understand how "the wiki worked," meaning what its intended use was and how best to use it for the creation of documentation
	Used tools to take apart the devices they were documenting	Perceived tools as "weird" objects that were used by repair experts to fix broken devices	Worked with tools to try to understand what they were used for, and what they had to do with the creation of documentation

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within our case study of the network surrounding the Technical Writing Project. Of the three students in Team One—Ben, Kurt, and Kelly, Kurt distinguished himself early in the Project as the team leader (note: all student names are aliases, as per participants' wishes). He was the first to ask questions of both Guiseppe and the iFixit technical writers, for instance, and was often the first to spot errors and needed improvements in his team's documentation. He also clearly saw the Project as an interesting challenge, as he was the first to express the belief in class that the technical writers were "experienced" writers who existed as part of a "real world" he had yet to venture into. This belief would later be echoed both by his fellow team members and by students in Team Two, as evidenced throughout final project cover letters, demonstrating his impacts on his fellow students.

What was perhaps most compelling about Kurt, however, were the ways in which he worked systematically to understand the rhetorical situation he found himself in, and what the available means were for creating effective documentation. He was the first student to revisit the Milestones for the Project, for instance, and to interrogate them as benchmarks for his team's developing documentation. As he would relate in his own final project cover letter: "you really have to check and recheck and recheck your information to be a technical writer." This "checking" work was a kind of triangulation that Kurt put his team through, a triangulation that included checking the inner-workings of the wiki, the camera angles of photographs of the device his team was assigned to document, the overall purpose of the documentation they were creating, and help and feedback from the technical writers.

Kurt's writing process within his team, in fact, would heavily influence our coding scheme for all data collected. When we realized that Kurt was engaging in a very interesting, and networked, writing process, a writing process that involved a kind of feeling out of all the available affordances among other people, tools, and technologies, we stopped thinking of our study as a simple writing process case study and began thinking of it as a case study of a network, a network involving various interrelated, and reciprocally impactful, components. Once we began to understand this, we knew we had to try to understand exactly how all the components present were interrelated, and turned to the theories of socio-technical assemblage

and speculative realism that we summarized above for possible units we might analyze.

To first test out this conception of our data as representing a network involving both material objects and knowledge-making processes, we used Kurt as our first potential actor by sketching the initial grid represented in Table 2 above and trying to understand how Kurt's behaviors as a writer related to all the other components with which we observed him interacting. In collaboration with Nathan and Sheryl, for example, Guiseppe attempted to triangulate Kurt's behaviors with behaviors among the other people, technologies, and tools by going through each separate piece of data, articulating any interactions that were evident between Kurt and other actors, and then writing the first draft of the above narrative regarding Kurt and sending it to Nathan and Sheryl to see if it made sense to an audience outside the initial research situation. Nathan and Sheryl, in turn, were the first to question what *affordances* Kurt was responding to, and to ask if what Guiseppe had observed Kurt doing was rhetorical in both an epistemological *and* ontological sense, or, in other words, if Kurt was potentially making knowledge via the affordances of material components he perceived as available to him. This would result in expanding the grid to include categories for "affordances" and "rhetorical impacts," and broadening the coding process to include each separate actor we could parse. As we represent below, through this process, students, technical writers, wiki technologies, devices, and tools associated with the Technical Writing Project would arise as actors that impacted one another within the observed network of our case study.

Findings

In this section, we present our findings in three subsections. Each subsection is centered on a particular kind of rhetorical impact we observed between the actors we studied. The first subsection, for instance, discusses the iFixit technical writers and their intended, and actual, impacts on other actors, including their belief in the "Right to Repair," or the belief that all users of technological devices should have the right to repair their own devices. The next subsection is devoted to iFixit's toolkits and wiki technologies, and how they influenced the human actors who used them to create repair documentation. Finally, we present the impacts

we observed students exerting as they worked to create effective repair documentation for the first time.

iFixit Technical Writers and the Right to Repair

Started in 2003 by two college students enrolled at Cal Poly San Luis Obispo, iFixit has become known within the tech world for providing repair information on electronics. As a startup, iFixit was run out of the shared dorm room of Kyle Wiens and Luke Soules and provided free, open-source repair guides as well as parts and custom toolkits to help users successfully repair their devices. At the center of iFixit, is their massive wiki of free, publicly available repair guides that any user can contribute to. Dubbed "the free repair guide for everything, written by everyone," the ten-year-old wiki (http://ifixit.com) contains over ten thousand repair guides generated by a pool of over six hundred and sixty thousand hobbyists, technologists, engineers, technical writers, and technical writing students who are regular contributors to the site (B. McCrigler, personal communication, December 3, 2013).

iFixit also devotes significant resources to outreach and engagement around what they call the Right to Repair, or a series of environmental, socio-political, and consumer rights issues surrounding electronics. As the landing page of their wiki boasts: "iFixit is a global community of people helping each other repair things. Let's fix the world, one device at a time." One of the main instances of this outreach is of course the Technical Writing Project, which (at time of writing) has generated over three thousand, five hundred guides developed by students at more than twenty universities, each guide averaging two thousand, six hundred views within six months of being posted, with a grand total of ten million, five hundred thousand views on student guides so far (M. Djuric, personal communication, October 14, 2013).

For the iFixit technical writers we interviewed, however, repair is as intimately tied to the effective application of tools, technologies, and knowledge-making as it is to creating impacts on people who use technological devices. As Miroslav Djuric, Chief Information Architect and founding member of iFixit, put it during his initial interview:

> From the outset, the founders [of iFixit] knew that there was going to be no way for us to do all of these guides in-house and that we would need help from

the Internet to do them. So, we started building a wiki-based system for information pertaining to repair… Now, granted that sometimes may not be as desirable, because sometimes erroneous information gets posted, so we have what we call a moderation queue, where all of the changes made on iFixit, somebody has to review: either an iFixit admin or a moderator on the site. And, to determine who is a moderator, we've set up a reputation system. So, the more you participate in iFixit, the more your reputation can go up by people upvoting your correct response to a question or liking your guide. Eventually you reach moderator status because we figure you've been on iFixit long enough, so you can go in and approve or moderate some of these other changes. …Now, there are sometimes debates whether you can do this procedure one way or the other, and so what we've found in the past was having somebody update a guide and change the procedure a bit. And so every time that happens, we catch it, and I go ask some of the technical writers, "hey, such-and-such on the Internet has suggested that we take out this cable first instead of the other one." So then, we go back and look through the guide—we usually have a standalone device that we can play with that's already broken and so we go through—and we verify and if it's a decent suggestion, it goes live.

This emphasis on repair, moderation, and process improvement is interesting, for our purposes, from a rhetorical standpoint. It calls for both an approach to the affordances of a variety of tools and technologies, as well as a social element that involves knowledge-making with other people.

This emphasis is displayed, for instance, throughout the interfaces available to first-time repairers, such as Guiseppe's Technical Writing students, who are faced with a series of rhetorical options at each stage of the creation of their documentation, such as when creating a new wiki page (see Figure 1). On this first page, writers must choose between several smaller genres (for example, Guide, Device, Wiki, or Item), each of which calls for a different orientation to knowledge-making, tools, technologies, and other people. While a Guide page uses "how-to instructions" and "high quality photographs" to "teach someone how to do something," for instance, a Device Page is "anything that warrants a

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repair manual." Students from both teams spent a large portion of the first class in which they actually began working on the Project, studying this page, interrogating its affordances, and asking questions to Guiseppe about how they might proceed.

Figure 1. Creating a New Wiki Page

Both teams then chose to begin with a Guide page, even though the Milestones for the Project recommend starting with a Troubleshooting Page, or a page devoted to common problems users have with a specific device. Their rationale, as Tricia, a student from Team Two, put it during class, was that this was their best way to "figure out" how to proceed because they felt "overwhelmed" by the Milestones and all the generic specifications they presented. iFixit's development of the reputation system that Miroslav mentions above, a reputation system that rewards merit through community-based participation and the specific effects community members have on one another, is an example of a system that supports an epistemology of "figuring out," however. Within such a system, the ground for knowledge-making is constructed by the interactions of a variety of actors, both human and nonhuman. Each moment in the writing process

for creating documentation for the Technical Writing Project asked students to leverage a variety of actors, in other words, actors who influenced their decision-making processes at the same time that they were in-turn influenced by decisions students made.

Because Guiseppe was only on his second run-through of the Technical Writing Project, for instance, he emailed Brittany McCrigler, iFixit's Director of Education Services, to ask for validation regarding his students' decision to go against the grain of the Milestones. Her response was that students could approach the project however they saw fit, and that the Milestones were simply guidelines to consider. This response appears emblematic of an approach to knowledge-making championed by several speculative realists, such as DeLanda (2013), who argued that knowledge-making must account not only for "knowing-that" relevant facts exist, but also for "knowing-how" to put the contextual information surrounding facts into action (p. 73).

Within such a paradigm, knowledge workers can't focus exclusively on knowing-that formulas for producing assumptions, by which we mean that their focus can't be on what is already known. Miroslav's above response to a hypothetical Internet user suggesting a change to a professionally-produced guide could be: "no, we already *know that* this is the best way to repair this device." He goes beyond this to demonstrate a knowing-how model of knowledge-making when he admits the possibility that a professionally-produced guide could be improved by investigating *how* a new solution might improve the guide. This approach to knowledge-making is also exemplified by Brittany's comfort with students figuring out their own approach to creating documentation, even when a perfectly good workflow already exists and is articulated in the Milestones. As Brittany put it during her initial interview:

> We do rely on our community and we do rely on our students. Our students create a lot of content for us and so does the community, because right now we have a small technical writing team, and we can't write thousands of pages a day. So, we spend a lot of time making sure that that experience is good, that the students have a good experience and that they learn how to do it, and users find it easy and want to contribute. We've learned a little

bit about the human psychology on the Web and how people interact with [the wiki], but it's really amazing to see how many people do contribute. Like Wikipedia, it helps to have that wider knowledge base for things. We've done a few car guides, [for example,] but we don't really have the ability to strip a car down to its nuts and bolts, so it's nice to see users able to arrive at information.

Writers are "able to arrive at information" as part of the Project because that information is produced via emergent, knowing-how formulas, formulas which encourage writerly engagement and participation in the networked production of knowledge. Repair documentation here represents a form of knowledge-making wrought through the physical manipulation of tools and technologies, tools and technologies that can be used in a variety of ways, ways that in turn impact the people who use them. At the same time, however, this knowledge-making is never quite finished as other writers troubleshoot, debate, and bring in their own perspectives "from a wider knowledge base," or the sum total of knowing-how formulas made available via all the users of the wiki. The rhetorical impacts created by—and on—individual writers (and other kinds of actors) within the iFixit wiki is thus highly relational and is afforded by technologies that allow for multiple solutions to problems to co-exist (such as in a discussion forum).

As our third iFixit interviewee Andrew Goldberg, technical writer for iFixit and former participant in the Technical Writing Project, said during his interview:

Helping the students helps us teach people how to improve the community. They're [key] in expanding the community and getting people to come in and contribute, ask questions, make guides. That's what we really want to be able to expand: the entire world of coming here, fixing things, and teaching people how to fix things.

Throughout our analysis, we saw evidence that the Right to Repair is a central motivating force behind the "entire world of coming here," or the experiences students have creating documentation for the Technical Writing Project. This ideal of "teaching people how to fix things" arguably scaffolds the entire process of the Project, from the ways

students are invited to enter the Project by making rhetorical choices involving how they want to impact other members of the community, to the tools and technologies that iFixit has developed and mobilized in support of the Project. As we discuss in the next section, however, these tools and technologies also exhibited a life of their own in our case study of a technical writing project intended to showcase the importance of tools and technologies in our daily lives.

The Technical Writing Project's Nonhuman Actors and How They Impacted Their Human Counterparts

A central theme in the body of literature come to be known as speculative realism is the de-centering of the human actor as the sole arbiter of action within networks (Bennett, 2010; DeLanda, 2013; Harman, 2002 2005, and 2009; Latour, 2005). These theories further hold that everyday objects like tools, technologies, and even furniture can initiate action in the world in meaningful ways. One object that was of particular interest to us in our case study of the Technical Writing Project was the "spudger," a tool that is part of the toolkit iFixit sends to instructors for use in the Project (see Figure 2). Designed to enable repairers to leverage small openings in devices, many of which hide components that are glued together by manufacturers to prevent repair, the spudger plays a key role in the Project by allowing writers to pry open devices, further enabling them to document internal components. Though not invented by iFixit, the spudger has become a hallmark of the iFixit toolkit because of the frequency of its use in the repair process (B. McCrigler, personal communication, April 4, 2013).

Figure 2. The Spudger

First-time repairers, such as our student participants, are often confused by the tool, however, because, in the words of Becky, a member of Team Two, the tool is "weird." During a follow-up interview with Brittany, she also revealed that this reaction is common not only among students who engage in the Project for the first time, but also among members of the press who have

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interviewed her about the Project (B. McCrigler, personal communication, April 4, 2013). When we investigated this shared belief among the participants of both student teams that the spudger is a "weird" object, we began to understand that by weird, participants meant that they didn't understand the intended purpose of the tool, or necessarily even see it as a tool, at first. For both teams, the spudger was an odd-sounding object whose potential impact on the Project was yet to be discovered.

> "What is *this*?!" Becky exclaimed on the first day that the toolkits were handed out, holding the spudger up and examining it dubiously.
>
> "It's called a spudger. It's used to pry open devices," Guiseppe replied.
>
> "A *spudger*? That's weird."
>
> "Maybe, but it's also useful. You'll see."

It was only when they first required the use of a spudger, such as when they began to disassemble their devices to document components for Repair Guides, that our student participants began to recognize its surprising utility, and the role it plays in the repair process. As mentioned above, both student teams made the decision not to follow the progression for the Project suggested by the Milestones, which suggested creating a Troubleshooting Page first. Students decided instead to start by disassembling their devices into their basic components, to "see how they worked" in the words of Kurt. For Team One, their device was a Sony Ericsson W890i, and for Team Two, it was a BlackBerry Pearl Flip 8220. As anyone who has tried to repair one of their own devices knows, disassembling a device that a manufacturer has effectively sealed, often in a way that actively prevents repair, is no mean feat. As each team attempted to disassemble their devices into their basic components, they quickly encountered this difficulty.

Even when one removes all the screws in a device, using the miniature screwdriver included in iFixit toolkits, the components of some devices are glued together. This was the case with the BlackBerry Pearl, which needed to be pried apart. As luck would have it, this was also the device assigned to Becky's team. Guiseppe observed Becky, while helping another team

in the class, going systematically through the iFixit toolkit, trying each tool in turn. Finally, with a brief pause, she eyed the spudger, and then picked it up, applying it to the case on her device. After using the pointed end of the spudger to create a gap between the two halves of the case, she deftly flipped the tool around and used the flat end to pry the two halves apart. With a satisfying pop, the case finally came apart and Becky clapped her hands in excitement.

Moments such as these in which nonhuman actors impacted the actions of their human counterparts, we argue, are evidence of the potential rhetorical impacts of nonhuman actors within professional networks like the one surrounding the Technical Writing Project. Becky first perceived the spudger as having virtually no affordances for her writing process. When the spudger enabled her to complete a necessary task, dissembling her device so she could document its repair, the spudger also impacted her perception of it, and what it could do for her. In a very real sense, it became an actor in that moment, in the form of a tool that had suddenly demonstrated its usefulness.

We saw evidence of such impacts every time a student responded to an affordance that was specific to a tool or technology they needed to leverage for the Project. These nonhuman actors impacted the ways students pursued the writing of their documentation, presenting opportunities for doing so, as well as limitations. This process was reciprocal, in other words: as students tried out the affordances of a tool or technology, they discovered how those affordances affected the rhetorical choices they had before them. Each choice created a range of new choices within the networked writing process they were engaged in.

This was also evident, as we explain below, in the ways students began to perceive what they were doing as a specific kind of knowledge work. As Natalie, a member of Student Team Two put it, after her team had completed the disassembly of her device: "So, we've taken apart our device—now what do we do?" Having chosen to largely abandon the Milestones, students suddenly found themselves in unfamiliar territory, with parts of their devices lying all over the tables in the computer lab in which the class took place. To move forward, they had to begin to interrogate the Milestones as affordances linked closely with the wiki technologies they would use to create their documentation.

Students as Knowledge Workers

An open-ended, but empirically-grounded model of knowledge-making founded in knowing-how formulas seems very pertinent to the learning environment common to many technical communication classrooms, where students are often expected to generate some variety of technical expertise at the same time that they strive to become proficient and flexible communicators for real world audiences. This was certainly the case in Guiseppe's classroom, where students were introduced to a variety of professional knowledge-making strategies, from staging instructions in documentation to best practices in Web-based content strategy—all in preparation for their participation in the Technical Writing Project. As student participants began the project, however, during the last third of the class, they quickly encountered the important differences between knowing-that and knowing-how. This was summed up in Kurt's response to the project, that, "you really have to check and recheck and recheck your information to be a technical writer."

After several assignments traditional to technical communication pedagogy (which asked students to craft materials for fictionalized cases), student participants were surprised by the degree to which the Technical Writing Project required a hands-on knowledge of their assigned devices (including how to disassemble and reassemble them), and how to correctly describe and photograph each step of a specific repair process. As has already been mentioned, students in each group initially struggled to stage their repair, and to understand the intended rhetorical impacts of their documentation on a larger audience of people seeking help for fixing their own devices. This was exacerbated by their decision at the beginning of the Project to pursue a path alternate to the suggested Milestones.

Having gotten stuck after disassembling their devices, however, both student teams, led by Kurt (Team One) and Tricia (Team Two), respectively, began to interrogate the Milestones as potential guidelines for moving forward. Specifically, they began to discuss the utility of a Troubleshooting Page, mentioned in Milestone 1, and what it meant for the audience of Internet users who utilize the iFixit wiki to help them in their repairs. Through discussions with Guiseppe, students came to understand the Troubleshooting Page as a key touchstone between the needs of this audience and their developing documentation. They

began to invent possible scenarios for repairing their respective devices, to research such scenarios online, and to include these scenarios in their incipient Troubleshooting Pages. This moment of comprehension got both teams of students writing within the iFixit wiki. Once they understood the Troubleshooting Page as a way for audiences to utilize their documentation, and thus created drafts of these pages for their devices, they were able to further invent specific repair processes that users might engage in.

This kind of networked writing process, we'd like to further claim, facilitated a knowing-how model of knowledge-making for the creation of repair documentation. Rather than focusing on the fact of their disassembled devices, students began to hypothesize how visitors to the iFixit wiki might utilize the disparate parts of these devices to perform a specific repair. Students began to ask questions of each other in their teams, such as "well, what would someone need to do to replace their battery?" and "what if their motherboard went out?" Such critical interrogation would eventually lead to documentation that provided step-by-step guides to repairing specific elements of their devices (see Figure 3). The creation of such documentation required students to hypothesize how users of the documentation might actually put it to use, in other words, rather than simply relying on factual knowledge regarding the current status of their devices (for example, whether or not it would turn on, how new it looked, obvious damage, and so forth). Students had to mobilize a rhetorical knowledge of the future life of their documentation.

Figure 3. Team One's Guide to Replacing a Battery

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Such rhetorical knowledge also extended to requests by iFixit technical writers for deep-level revision of student drafts of their documentation. Once students had completed these drafts, they expected them to immediately rise to the level of workable documentation, as judged by iFixit technical writers. However, they quickly discovered that this wasn't necessarily the case. The technical writers found numerous issues in both drafts, including photographs that didn't communicate repair steps effectively, textual descriptions that needed to clarify what was being done at each step of repair, and possible repair processes that hadn't been included (but were common ones the technical writers received requests for). Even though the technical writers were encouraging and complementary in their critiques, these requests for revision made Guiseppe somewhat nervous that students would lose investment in the Project altogether.

Fortunately, both student teams would rise to the occasion, working hard to complete several rounds of revision in collaboration with the technical writers. Students seemed to genuinely appreciate the challenges of working with writers who were members of a professional network they were encountering only briefly. As Tricia, a member of Team Two, mentioned in her final project cover letter:

> Throughout this project I have come to learn just how technical technical writing really is. Each time our group was hoping to be finished with our guides, there was another area to improve, correct, or modify. The slightest change in wording can change the entire step, so it is crucial to review each step throughout each guide to ensure the audience will understand it to its entirety. In addition, I have come to learn that although working in groups may not always be ideal, it's an important skill in the writing field; communication is key.

Like a good speculative realist, Tricia seems to appreciate her encounter with a rhetorical situation that outstripped her previous understandings of professional communication. She further appears to perceive this situation as representative of knowing-how formulas for making knowledge that are important to the professional world beyond the classroom.

In this way, the networked process of checking, improving, and modifying writing in response to

a variety of both human and nonhuman actors we observed among our student participants appears appropriate to a learning environment meant to train flexible communicators who can adapt to a variety of tools, technologies, and rhetorical situations. Though they found it to be a challenging final project, students we observed seemed to genuinely appreciate this opportunity to deal with a complex rhetorical situation, a situation that required "important skill[s] in the writing field." Finally, though we don't have data by which to gauge how their individual engagement with the Technical Writing Project impacted student behaviors after Guiseppe's class ended, their respective guides became part of the iFixit wiki (http://www.ifixit.com/Device/SONY_Ericsson_W890i and http://www.ifixit.com/Device/BlackBerry_Pearl_Flip_8220) and show evidence of having been put to use, both through discussion about them on iFixit discussion forums, and through revisions made to them by other iFixit users.

Implications

(Re)Considering Rhetoric and Its Role in Networks

One of the main implications to the above findings is that rhetoric plays an important role in the formation of professional networks, but that this role may be more complex than previously thought. This is especially the case if we consider the role of nonhuman actors in such networks, and the rhetorical impacts they have on their human counterparts. It is unclear, for instance, how to prepare professional communicators, such as technical writers, for knowledge-making that is as dependent on the impacts tools and technologies have on humans, as it is on the ways humans employ tools and technologies. Findings such as ours, as well as those of our precedent scholars cited above, indicate that new models of rhetoric that account for these emerging complexities must be developed if technical communication scholars are to successfully come to grips with new social realities that confront us on a daily basis.

In an effort to orient an admittedly ongoing conversation toward such models, without presenting definitive conclusions on what such models should contain, we offer the following heuristics as takeaways from our above argument:

1. *More knowing-how, less knowing-that*: If rhetoric, as deployed in technical communication, is to become

a discipline centered on assembling knowledge rather than proceeding from accepted knowledge, then we must work harder to become tinkerers, as iFixit technical writers would have it. We need to take things apart, put them back together, see how they work, and then encourage this behavior in our students. And this tinkering should not only involve technologies, but also assumptions as well. We might ask questions like: what makes a research method viable for a professional communicator in a society increasingly mediated by technological and technical complexity? What makes a knowledge-making strategy salient if we embrace the notion that we can never fully understand the potential impacts of technologies and tools within networks we find ourselves in, but must instead measure the impacts of these actors *as we employ them* to find our footing?

2. *Decenter the human rhetor*: If models of rhetoric, and their attendant assumptions regarding knowledge-making and social impact, are to embrace nonhuman as well as human actors, then we must carefully examine the impacts of the nonhuman on the human and vice versa. Such examination might beg questions like: what do these impacts mean for the way we employ trusted rhetorical concepts such as the rhetor, topoi, audience, and memory? How can we employ these concepts as fundamentally epistemological and fundamentally ontological at the same time? What would it mean for these concepts to be less siloed as discrete concepts and defined more based on their impacts upon one another within a given network?

3. *Study complex social realities*: To develop such models, we might begin to investigate increasingly complex rhetorical situations that necessarily involve high levels of human-nonhuman interaction. It would've been much simpler for us to present a case study of technical writing students, for instance, or technical writers, or to present a rhetorical analysis of a very interesting technology for creating open source documentation. Once we realized that the rhetorical impacts we were investigating necessarily involved the interactions of all these actors, as well as several others, we decided to represent the complexity of a variety of

relationships, rather than just one specific subset. Such studies risk discerning no tangible links between units of study, but the potential rewards of such research are that it might teach us new ways of learning, new ways of doing, and new ways of impacting key audiences and stakeholders.

4. *Reconsider social justice as technological as well as social:* Though many will probably agree with this statement, it is important to remember that the experiences users have within technological systems, and with their attendance devices, are party to the same social constraints and systems of ethics as experiences that happen outside of such systems. If we have learned anything from the participants of this study, it is that injustice can be found in even the most highly-technical and knowledge-based systems, as in the case of manufacturers who design cutting-edge technologies that are nearly irrepairable and then restrict access to knowledge used for repair to encourage blanket consumerism, all without due consideration to increasing amounts of electronic waste. Professional communicators invested in becoming advocates for both social *and* technological justice might find new and inventive avenues for improving our world.

We hope that the above heuristics are taken as encouragements to discussion rather than as agonistic assertions. If we have learned anything from this research project, it is that tinkering involves failure, frustration, and being willing to be wrong, but that this is a good thing. It's important. Failure is learning. At the least, we hope we have presented a compelling case study of an emergent professional network that bridges educational and workplace contexts, a network that is being used by professional communicators and students to foster compelling varieties of knowledge work. We also hope, however, as every researcher does, that our findings might help our colleagues across various disciplines to develop even more robust and socially useful research methods, outcomes, and models.

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Jackie Damrau, Editor

Books Reviewed in This Issue

Cut and Fold Techniques for Promotional Materials

Paul Jackson. 2013. London, UK: Laurence King Publishing Ltd. [ISBN 978-1-78067-094-2. 120 pages. US$24.95 (softcover).]

Looking for a book of theory with discussion on the subject of promotional materials? Paul Jackson's book is *not* it. Buy a copy only if you want a hands-on book with creative projects to engage your customers, staff, and maybe family members. Then pull out your mechanical pencil, ruler, scissors, and glue. Beside them, place a craft knife, drafting compass, triangle, and protractor. A paper cutter is useful, too.

Ah, you can see that Jackson really meant it when he titled the book, *Cut and Fold Techniques for Promotional Materials*. Each chapter contains six projects suitable to be printed with your company's promotional content. The projects are grouped in chapters titled "Flexagons," "Modular Solids," "Envelopes," "Puzzles and Illusions," "Folded Booklets," and "Novelties." Jackson has a number of engaging projects that your customer will assemble and keep on his/her desk with your logo visible. You likely remember some projects from school days.

Hand-eye challenged, I enlisted help from my spouse (a mechanical engineer). We made three projects for this review: two flexagons and one envelope. With the help of my sister-in-law (an artist), I then used the envelope instructions to produce twenty elegant party favors for a celebration. Other projects that still inspire me to make them are a folded booklet and hanging letters.

Jackson expects your professional printer will supply the A4 paper required for most of the projects. For test purposes, you need to know that the A4 aspect ratio is 1.4142. If using letter-size paper instead of A4, you must do some math and cutting. (*Hint:* Remove 0.72 inches off the 8.5 width.)

Two folding techniques are important to learn: valley folds and mountain folds. One fold is toward you; the other toward the back of the paper. The "Before You Start" chapter provides a list of symbols for the needed folds and cuts. Each project's instructions call out these symbols.

You may need a magnifying glass to read the instructions. *Cut and Fold Techniques for Promotional Materials* uses a thin, san-serif font in six points throughout, right beside the excellent step-by-step drawings. A hands-on person may just refer to the drawings. I read the instructions carefully. They were accurate, although the drawing was always the final reference.

History buffs will appreciate the book's "Provenance" section. Jackson provides a source of references that he was able to track down, some dating back to 1939. Your Marketing department will want to borrow the book. Don't expect them to return it.

Donna Ford
Donna Ford has been a member of STC, joining in 1990 and serving on her local chapter's board for many years. She has been a technical writer since 1987 in the hardware, software and government health care industries. She holds a certificate in Information Design from Bentley College.

Science from Sight to Insight: How Scientists Illustrate Meaning

Alan G. Gross and Joseph E. Harmon. 2014. Chicago, IL: University of Chicago Press. [ISBN: 978-0-226-06848-0. 332 pages, including index. US$30.00 (softcover).]
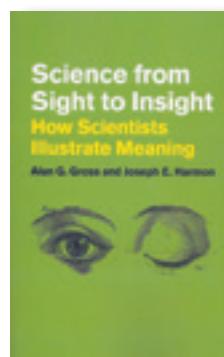
Although I knew that *Science from Sight to Insight: How Scientists Illustrate Meaning* would be about visuals in scientific communication, I was surprised at the depth of the research and philosophy behind the complex foundation of this book, which is an attempt to develop "a general theory of verbal-visual interaction in the communication of science" (p. 2).

Today, science is a public interest with a solid place in popular media. We use scientific illustrations, graphics, or information graphics to communicate meaning to a population that often has limited knowledge or understanding of highly complex scientific notions. The heart of the book is taking

readers through a scientific and "synthetic" process to understand how visualization practices work regarding communicating scientific meaning. Readers need to understand the changes in scientific visualization over time, and not just that "scientific visuals evolved, but that they evolved in a certain direction" (p. 79). Gross and Harmon begin discussing Heidegger's philosophy of science, then include how scientific visualization is influenced by Gestalt theory, cognitive psychology, dual coding theory, semiotics, history, sociology, and other exigencies. The authors discuss scientific visualization evolution from a historical and technological perspective, such as how PowerPoint and the Internet change the way we conduct, share, and even understand science.

Gross and Harmon's extensive research and sophisticated discussions in *Science from Sight to Insight* are a strength and a drawback. Each chapter is a progression toward the comprehensive theory of scientific visualization, a progression that is well-supported with abundant and relevant research. Yet, the discussion's denseness and even the assumptions of readers' familiarity with the background material drastically narrow the book's audience. I looked at using this book in a graduate class on scientific communication because I thought it might lead to philosophical discussions about scientific truth, knowledge and knowledge creation, thought processes assigned to "scientists," Darwin's illustrations, and other debatable issues regarding science, truth, and communication. That idea faded as I saw the understanding needed to get through each chapter's literature review. My assumption is that only those professionals who are actively involved in scientific visualization studies will appreciate the vast and deep examination of applicable literature that gives Gross and Harmon the basis for their own argument. Since the authors did a good job of making their case regarding the importance of developing this visualization theory and knowing how prominent science has become in the media, the information in *Science from Sight to Insight* seems highly relevant to graduate students studying scientific and technical communication. However, the book's specialized audience may severely limit the understanding and use of Gross and Harmon's meticulously researched and explained discoveries.

Diane Martinez

Diane Martinez is an assistant professor of professional and technical communication at Western Carolina University. She previously worked as a technical writer in engineering, an online writing instructor, and an online writing center specialist. She has been with STC since 2005.

Editing Across Media: Content and Process for Print and Online Publication
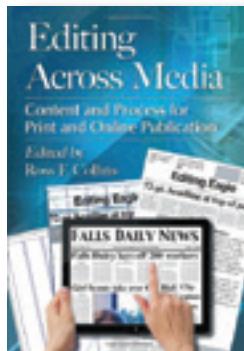
Copy editors today take on many responsibilities not included in their job descriptions only a decade or two ago. In Ross F. Collins' words, "Today many editors have to do more, know more, be more" (p. 1). This book of 11 essays is intended to serve as a journalism textbook to familiarize students with "all jobs listed under the title 'editor' in the twenty-first century." The authors provide the "minimum competence" (p. 2) Collins believes a prospective editor needs today in mass media.

Editing Across Media: Content and Process for Print and Online Publication focuses mainly on copy editing newspapers, with many of the essays delving into the job's nitty gritty. A chapter on the editor as writer singles out the most frequent grammar errors along with common Associated Press style mistakes. Several essays cover designing print and online newspapers, now often included among editorial responsibilities. The text provides students with historical background on the development of type as well as details of type styles and fonts, and advice on choosing typefaces. Guidelines on sketching dummy sheets, choosing photos, and laying out pages continue the design lessons. One essay is dedicated to headline writing.

Besides the details of newspaper production, journalism students will find other important topics, including ethical and legal issues involved in publishing, and advice on developing the judgment skills needed for the editing process. The authors touch briefly on Internet issues, such as paywalls and citizen reporters.

The final chapter presents a project example where a class produced a print magazine.

Editing Across Media: Content and Process for Print and Online Publication presents the basic concepts of newspaper production that today's copy editor needs on the job. The essays are well written, and each includes a bibliography and student exercises. My main criticism of the book lies with the title, which suggests a much broader scope than the book actually covers. I expected to learn something new about editing new media. I was disappointed by the book's old school approach. However, for someone who is new to editing and page layout, this book could be a useful resource.

Linda Davis

Linda M. Davis is an active STC member in the STC Los Angeles chapter and an independent communications practitioner in the Los Angeles area. She holds an MA in communication management and has specialized in strategic communication planning, publication management, writing, and editing for more than 25 years.

Principles of American Journalism: An Introduction

Stephanie Craft and Charles N. Davis. 2013. New York, NY: Routledge. [ISBN: 978-0-415-89017-5. 234 pages, including index. US$49.95 (softcover).]

Journalism as a profession is challenging to define as well as to practice, according to Craft and Davis. Yet, it is essential to America's democracy.

Principles of American Journalism: An Introduction introduces its readers to the field, including journalism's birth in the Enlightenment, its economic and technological evolutions, and its ethical responsibilities in society. It has no instructions or examples on how to write a news story, rather its purpose is to explore the beliefs and behaviors of what is accepted and expected of journalists.

This book uses several textbook conventions. For example, each chapter has a bullet list of learning objectives and callouts for important definitions and discussion questions. Every chapter ends with a summary, suggested class activities, and a bibliography. The most interesting of these conventions are the sections called "The View from the Pros," in which practicing journalists write about real case studies.

Textbooks can be dry even with enthusiastic writers. The authors being mindful that they are writing to undergraduate students use a conversational, humorous tone to help keep their readers' interest. For example, they write, "But of course you know that already from Chapter 2" about a point they make in chapter six (p. 135). In addition, they are being both sly and earnest when they say on page 3, "We are skipping a ton of really interesting history here in the name of brevity."

Being brief is the nature of an introductory work. However, Craft and Davis delve into weighty discussions, such as modern journalism's ethical codes. Furthermore, they write with conviction about the freedom of the press granted by the First Amendment. Indeed, *Principles of American Journalism* discusses a variety of topics, but much of the writing is dedicated to American journalism, namely its roots, its particular news topics, and also its commercial business model.

Craft and Davis remain balanced in their discussions of journalism's tenets, except perhaps when they contrast the American business model with the government-sponsored British system, which they admire. Ironically, it was the British repression of the press in the 18th century, the authors point out, that lead to America's freedom of the press.

Yet, this is not a contradiction in their thinking but an example of the competing ideals within journalism. Journalists often make difficult ethical decisions, such as balancing the privacy of citizens with the public's right-to-know, competing to "get the scoop" while being responsible for getting the story correct, and deciding to remain dispassionate observers or to become voices of those in trouble.

This tension between contrasting principles is the heartbeat of *Principles of American Journalism*. The authors argue that there are few easy answers in a democracy and in journalism. With this strong pulse beating within a thoughtful structure, this textbook makes a good introduction to modern American journalism.

James Morgan

James Morgan has been in nonprofit communications for sixteen years.

The Free eBook: How Gamification Reshapes Learning

eLearning Industry. 25 pages. http://elearningindustry.com/how-gamification-reshapes-learning
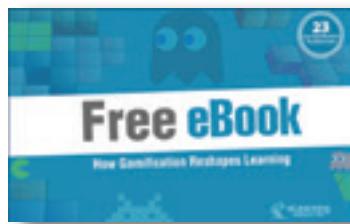
Gamification has become a hot topic in instructional design. Christopher Pappas says that gamification is "the use of game thinking and mechanics in a non-game context to inspire employees and students to get engaged in the learning process" (p. 2). Game mechanics can be as simple as integrating quiz questions in a training seminar or as sophisticated as constructing a reward system in which learners earn badges and unlock further content. In this free eBook produced by the eLearning Industry (www.elearningindustry.com), 23 top gamification professionals address the question: "What are the most effective uses of gamification in learning?"

Overall, the authors address this question thoroughly in their articles. They explain how and why gamification is an effective practice, and most provide examples of how they have implemented gamification techniques in their training design. From Karl Kapp's use of competitive games to engage his audiences during presentations (p. 10) and Kirsty Chadwick's integration of gaming elements in a legal training course (p. 11), to Marina Arshavskiy's gaming app to help recruit hotel employees (p. 13) and Michael Hugos' interactive simulator for supply chain operations, and several other examples not mentioned here, this eBook presents several concrete examples of implementing gamification in various learning environments.

This eBook also addresses tips on how to deal with negative perceptions of gamification. For example, T. Raven Meyers discusses how her company handled concerns from parties who viewed a medical gaming app as a mere toy, and not as a tool to help students learn and retain information for their board exams (p. 24).

Despite its short length, this eBook connects the reader to much more content through its handy contact links for each of the 23 authors—from email and social media addresses, to links to demo tools.

The only drawback of this eBook is that the table of contents is organized solely by author and not by topic.

This is good if you are already familiar with the author, but not as ideal if you want to research specific topics within gamification. Basically, this is not a book where you simply look up a specific topic and find what you need on page X. Rather, you flip to page X and discover nuggets of wisdom. The essays may answer the same question, but they are independent of each other.

Despite the lack of indexed topics, this eBook is still a valuable resource to learn more about what gamification is, and how to apply it in various settings.

Jamye Sagan

Jamye Sagan has over 10 years of technical communication experience. She is the pharmacy communications advisor for H-E-B Grocery Company in San Antonio, TX. A senior member, Jamye is active with the Instructional Design & Learning SIG, where she has contributed several Summit session reviews for the SIG's newsletter.

Successful Proposal Strategies for Small Businesses: Using Knowledge Management to Win Government, Private-Sector, and International Contracts

Robert S. Frey. 2013. 6th ed. Boston, MA: Artech House. [ISBN 978-1-60807-474-7. 676 pages, including index. US$139.00 (hardcover).]
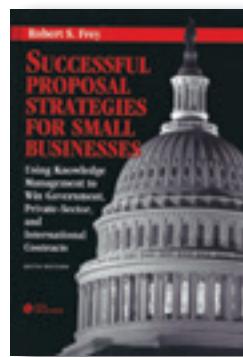
Robert S. Frey knows proposals and knows the current fiscal climate in which businesses, particularly small businesses, are trying to win work. This sixth edition of *Successful Proposal Strategies for Small Businesses* is updated to address the decline in federal government spending. It is also updated to more fully address the "important human and organizational dynamics related to the proposal life cycle that contribute directly to winning new contracts" (p. xxi). That is, Frey addresses the all-important people aspect of proposal work and the all-important cultural aspect of small organizations trying to strategically align themselves to win big work.

This book is a must-read for anyone who is new to federal government contracting and federal government

proposal work. The extensive glossary and list of acronyms and abbreviations will be an invaluable resource as well as the book's touching on all aspects of proposal development—from pre-solicitation marketing to post-award business complexities. In addition, the templates in the book are provided on the accompanying DVD in Adobe PDF. While the templates are useful, the interviewing templates (Chapter 3) are superior and should be used by business development and project management professionals to cultivate relationships with their clients.

Even seasoned proposal veterans will find something of interest and may even smile at Frey's inclusion of one small, two-paragraph sub-section about proposal work being fun. It is fun and rewarding, but also demanding and Frey does an excellent job of articulating those demands. He also does an excellent job detailing the legislative, regulatory, and policy changes over the last 20 years that have reshaped the federal acquisition process, which Frey articulates, as one example, in a flow chart in Chapter 6.

Similar to the flow chart in Chapter 6, supporting graphics, tables, and charts in the book complement Frey's text. Some graphics, however, feature clip art images and text that are simplistic and do not add value to the discussion. While Frey's discussion on using graphics in proposals is thorough, readers should be cautious of using the graphics shown as good examples. Technical communicators and instructional designers will quickly see the limitations of the graphics that are used within the book. Instead, use the resources Frey references, or hire a graphic designer if graphics are not your, or your organization's, strength.

Successful Proposal Strategies for Small Businesses is a resource that proposal managers and business developers should have on their bookshelves. It is also a resource for Project Management Offices (PMOs), which Frey includes in his discussion and proposal shops. Although this looks more like a textbook than a business book, it is applicable to both students wanting to learn about proposal management and business people wanting to make sure that they are submitting strategic, client-focused proposals.

Liz Herman
Liz Herman, PhD, PMP, CPTC is a communications leader with 20 years of demonstrated achievements in delivering superior knowledge management solutions. She is a senior member of STC and is active in STC's Washington Baltimore Chapter. She currently works for Battelle managing clients within its health and analytics business.

Interviewing Users: How to Uncover Compelling Insights

You might think that asking users questions during an interview is an easy task. However, to get the information you are seeking during your interview, you want to invest the time up front in the planning stages to develop the best questions and approach you want to take when interviewing customers about their procedures and how they use your software.

In his book, *Interviewing Users: How to Uncover Compelling Insights*, Steve Portigal takes you through the entire interview process and even includes a chapter that instructs you how to analyze and synthesize your interview data. He includes in this chapter a timeframe for interviewing users.

Portigal's book arrived in good timing for me, as my documentation team is planning a set of interview questions for our internal subject matter experts. I am now making a list of suggestions for my documentation team. We are also using the guide to participate in fieldwork (page 70), which is also accessible in PDF format at http://rfld.me./PFG8dP.

Portigal addresses areas that one might not consider. For example, consider the number of participants in your team. The ideal team size is two people: one to lead the interview and another person to take notes. Once the team gets to three, Portigal points out that the dynamics change. The interview might not be as productive. Next, the seating in the room during the interview is important. Make certain the participant can see the interview team members without having to turn to make eye contact.

Chapter 5, "Key Stages of the Interview," is the richest part of the book. Portigal breaks down the interview into seven stages and then walks you through each stage. He even includes a piece from Ted Frank on how to get video as good as your insights. Frank provides valuable information and an illustration on how to prepare the interview environment to achieve a high-quality interview video.

When you begin the interview, always introduce your team to your participant and explain what is expected. Give the participant a thumbnail outline of the process, along with a time estimate.

Once the interview gets underway, Portigal suggests you remain silent after you ask a question and don't suggest possible responses. He explains that people speak in paragraphs. If you remain silent, participants are likely to continue with their responses.

During the interview, remember to signal your lane changes. As the interviewer, you know the destination, but the participant may not now where you are going with your questions.

Following the interview, it is important for the field team to write their observations as soon as possible and then come together as a group to summarize the findings. This way, you note the important observations during the interview.

You will find Portigal's book a valuable resource as you plan upcoming interviews with your users.

Rhonda Lunemann

Rhonda Lunemann is a technical writer with Siemens PLM Software, a senior member of STC's Twin Cities Chapter, and a member and officer of the Hill Speakers Toastmasters Club (Club 4415).

Microinteractions: Designing with Details

Dan Saffer. 2013. Sebastopol, CA: O'Reilly. [ISBN 978-1-4493-4268-5. 152 pages, including index. US$24.99 (softcover).]

Microinteractions: Designing with Details is a great book for thinking about design elements that are, as Dan Saffer puts it, the "difference between a product we love and a product we just tolerate" (p. ix). The book uses a simple, usable layout and defines central concepts in laymen's terms. The central term is thus defined as "a contained product moment that revolves around a single use case—a tiny piece of functionality that only does one thing" (p. 2). Throughout the book, Saffer details specific microinteractions through screenshots ranging from signups on social media sites to swiping motions on mobile applications. Reading this book not only gives you a working knowledge of the importance of these small-scale interactions, it teaches you how to design usable products and services in a variety of contexts.

As Saffer emphasizes, the main impetus for a book focusing on small-scale interactions is that they are often neglected in the rush to bring a product or service to market. Drawing on both personal and professional experiences that any technology user can relate to, Saffer illustrates with clarity and humor the frustrations of inadequate error messages, smartphone mute button glitches, and password forms that don't clearly instruct users how to create a sound password. What is perhaps most valuable for readers interested in any form of design or product development, however, is that Saffer offers simple, intuitive solutions to every problem he raises.

The key to this approach is his division of microinteractions into triggers, rules, feedback, and loops and modes, categories that he breaks down further within chapters dedicated to each. His final chapter is a reflection on a complete workflow for developing microinteractions, from their initial conception to user testing. Even readers with little knowledge of areas Saffer draws on like interaction design, information architecture, or usability will find the book's scope easily manageable. Readers can focus on a particular design element they may be struggling with, such as a trigger which indicates to a user that a particular interaction is available, or can use the overall framework presented by Saffer as a method for rethinking any form of digital communication and its usefulness to real people.

Overall, Saffer has broken the interactions users have with digital products and services into basic elements that apply to a broad array of contexts. Each element works as both a discrete aspect of microinteraction, as well as a case-in-point for thinking about design from the standpoint of its smallest working parts. At an even finer level, individual elements such as the trigger mentioned above are broken contextually into common conditions in which they are found, such as during errors, changes in user location, and new additions of data. This cogent balance between structure, context, and usability makes *Microinteractions* a recommended read for anyone interested in the finer details of design.

Guiseppe Getto

Guiseppe Getto is an assistant professor of technical and professional communication at East Carolina University, where he researches and teaches user experience (UX) design and the development of participatory cultures within communities and organizations as well as online.

Mining the Social Web: Data Mining Facebook, Twitter, LinkedIn, Google+, GitHub, and More

Matthew A. Russell. 2014. 2nd ed. Sebastopol, CA: O'Reilly Media. [ISBN: 978-1-449-36761-9. 424 pages, including index. US$44.99 (softcover).]
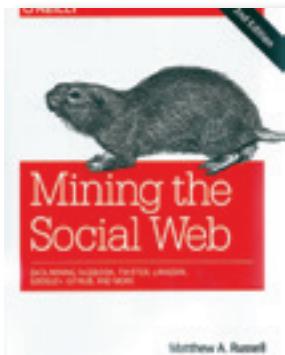
In 2011, Russell published the first edition of *Mining the Social Web*. At the time, I gave the book a positive, but tepid, review. As I read and apply the lessons in the second edition, I am enthusiastic in my positive review. From the Preface to the Index, this edition is easier to understand and apply. Like the first edition, the book is organized in chapters that explain why and how to analyze data from various sources, including Twitter, Facebook, LinkedIn, Google+, and GitHub. The book's organization makes it easy to focus on the content that is applicable to your scenario and filter out the irrelevant content.

The examples provided assume knowledge of the Python programming language. Some might argue that it's daunting for a technical communicator to know enough Python to use the examples, but, when motivated, anyone can learn. The IPython Notebook is provided as the interpreter so you can make the most of the sample code that is provided throughout the book.

On page 32, Russell has a wonderful paragraph that introduces how to calculate the lexical diversity of tweets. I love that people care enough about words to develop data analysis tools in an effort to find meaning. I want people to care about more than the money you can make from the data you can extract.

Russell discusses the topic of money later in the book when information retrieval is described as "a multibillion-dollar industry" (p. 179). While we can make financial gains from data analysis, I want anthropologists and other social scientists to have access to the data that can be calculated. It seems vital to understanding our culture and the implications of our actions.

Unlike the first edition, the second edition is divided into two parts: Part I. A Guided Tour of the Social Web, and Part II. Twitter Cookbook. Part one mirrors the first edition's structure. Part two is new, and, from an editor's perspective, it seems unbalanced. I see more companies are publishing cookbooks to make their content seem easier to digest, but the term seems to be more of a distraction. Nevertheless, part two extends the metaphor when promising "more than two dozen bite-sized recipes for mining Twitter data" (p. 349).

Russell presents the recipes consistently with a problem statement, followed by a solution statement, and discussion, as well as provides helpful examples. At the end of the cookbook, Russell suggests additional exercises and provides online resources.

Mining the Social Web: Data Mining Facebook, Twitter, LinkedIn, Google+, GitHub, and More concludes with three appendices that should be required reading to a practitioner, and, at eight pages, does not require much time.

Angela Robertson

Angela Robertson is a content strategist at IBM in Research Triangle Park, NC. Angela has an MS degree in technical communication from North Carolina State University.

E-Learning and Disability in Higher Education: Accessibility Research and Practice

Jane K. Seale. 2014. 2nd ed. New York, NY: Routledge. [ISBN 978-0-415-62941-1. 268 pages, including index. US$44.95 (softcover).]
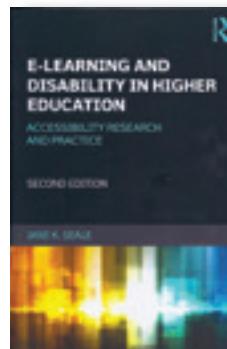
Jane K. Seale's second edition of *E-Learning and Disability in Higher Education: Accessibility Research and Practice* is a well-structured and focused text that effectively moves accessibility beyond its traditional discourse drivers: increasing numbers of disabled students in higher education, legislation, guidelines

for producing accessible learning (WCAG for example), and accessibility specifications and standards (Chapter 3). Seale's most important achievements in this edition are to not only identify multiple gaps and silences surrounding accessibility—including those of disabled students, accessibility practitioners, and policies and practices—but to effectively argue for and propose new approaches to accessibility research and accessibility practice. Given her emphasis on users and participatory research methods, Seale's suggestions will resonate with many technical communicators and usability researchers.

Researchers, technical communicators, and faculty who have little experience with accessibility—aside from the "follow these rules to avoid a lawsuit" institutional guidelines—will find a powerful text. In excellent rhetorical form, Seale sets the accessibility scene in the first section and identifies key drivers, stakeholders, and participants. The second section surveys the accessibility scene while the third section critiques it. Seale indicates in her Preface for this edition that the critiques are primarily about "voices and silences" (pp. xi-x). Throughout the first three sections, she cites research and findings from around the globe. This text presents an understanding that is nuanced, well-supported, and detailed for professionals who want to become familiar with accessibility and its complexity.

E-Learning and Disability in Higher Education offers much to accessibility practitioners and researchers. Besides Seale's thorough discussions and documentation—both solid sources for content whether presenting to colleagues on accessibility or fleshing out a literature review—the text's structure and organization is in itself a great model for persuading colleagues and administrators to see accessibility beyond the framing of traditional drivers. Additionally, the fourth section, "Reimagining the Scene: Voicing the Future for Accessibility Research and Practice," is a great initiator for discussions on different ways the field can expand its own research and practices. Just as Blakeslee and Spilka's 2004 "The State of Research in Technical Communication" asked a number of important questions that technical communication needed to consider, Seale's final section raises questions and suggestions of similar importance and value.

Seale's text offers additional value as a resource for faculty teaching in accessibility, usability, or disability studies, which complement a number

of reading lists. For faculty teaching research to graduate students, *E-Learning and Disability in Higher Education* demonstrates breadth and depth of research, connecting multiple facets of a complex topic and environments, and builds an extended yet readable argument. For those working to support accessibility in research, classes, teaching, and texts, but feeling overwhelmed by the drivers, legalism, and rules, Seale offers a refreshing take that blends a global overview while being specific, focused, and concrete enough to inspire action.

Gregory Zobel

Gregory Zobel is an assistant professor of educational technology at Western Oregon University. Trained in technical communication, usability, and rhetoric, he supports and trains educators employing technology to enhance and enrich learner engagement, accessibility, and content delivery in person and online.

Index It Right! Advice from the Experts

Enid L. Zafran, Ed. 2014. Volume 3. Medford, NJ: Information Today, Inc. [ISBN 978-1-57387-500-4. 210 pages, including index. US$40.00 (softcover).]
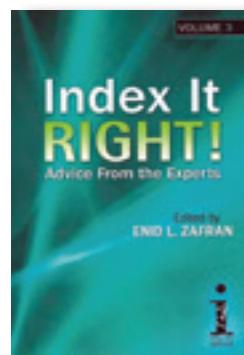
The *Index It Right* series provides practicing indexers with monographs on topics not usually covered in works designed to teach indexing basics. This third volume in the series, as the previous two, contains a dozen or so essays—in this case a baker's dozen—by experienced indexers who regard the crafting of competent, even elegant, indexes a contribution to the publishing process that determines to a large degree whether a document, be it paper or electronic, is usable and can successfully fulfill its information-conveying responsibility. That this mission is so much more than collecting terms and alphabetizing them at the end of a book should be obvious, but often it is not.

Index It Right consists of an Introduction by the editor, thirteen chapters on a variety of topics, contributor biographies, and an index. Topics covered are "Indexing as Canvas, Musings On" by Frances

Lennie; "Creating Real-World Ecommerce Taxonomies: Getting Customers to Products" by Fred Leise; "I Was a Teenage Taxonomist: The Light and Dark of Constructing Taxonomies at Bloomberg BNA" by Chuck Knapp; "Ebook Indexing" by Glenda Browne and Mary Coe; "Indexing Literary Criticism" by Martin White; "Let the Adventure Begin! Indexing Time-Spanning History Texts" by Connie Binder; "Indexing Scholarly Books Across Cultures" by Celeste Newbrough; "Medical and Science Indexing" by Anne-Marie Downey; "Indexing Math: Anyone Can Index Math, Right? After All, It's Only Numbers" by Cynthia Landeen; "The Heart of the Matter: An Introduction to the Challenges of Periodical Indexing" by Linda S. Dunn; "Chinese Personal Names: How to Decode Them" by Lai Heung Lam; "The Logic and Language of Patterns" by Scott Smiley; and "Teaching Indexing" by Lucie Haskins.

It is unlikely that every topic will interest every reader, but *Index It Right* is not meant to be read from cover to cover, one chapter following another. Rather, it provides a variety of topics, and the reader is invited to skim within or read in depth. Scott Smiley's chapter is for you if you have been perplexed by the "patterns" feature of your indexing software. Check out Lai Heung Lam's clear and detailed advice if indexing Chinese names has you puzzled. Martin White tells us that literary criticism is alive and well, and he explains the ins and outs of indexing it. Linda S. Dunn takes on periodical indexing, an area with its own particular challenges. Each chapter contains some information you probably do not already know, and if you need it or just find it interesting, it is there for you.

If you want more information about a type of indexing you expect to perform, or one person's experience teaching indexing to beginners, or how to obtain the most benefit from your indexing software by using patterns, or any of a number of other useful topics, you will find *Index It Right* a worthy addition to your library.

Karen Lane
Karen Lane is a freelance technical editor, indexer, and coauthor of a technical communication textbook, Technical Communication: Strategies for College and the Workplace. She is an STC Fellow and has served on several Society-level committees, as well as serving as program manager for the 2008 STC Technical Communication Summit.

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Lyn Gattis, Editor

Communication

Communicating corporate brands through social media: An exploratory study

Vernuccio, M. (2014). *International Journal of Business Communication, 51*, 211–233. doi: 10.1177/2329488414525400

"The aim of this study is to identify and interpret the main emerging strategic approaches in communicating a corporate brand through social media (SM). A quantitative content analysis of the SM platforms of 60 major international corporate brands yielded data that were processed by hierarchical cluster analysis. The study identified four clusters, characterized by distinctive approaches in terms of interactivity and openness toward corporate brand building via SM. The findings highlighted that despite encouraging signs of effective use of SM for this purpose, the online corporate communication initiatives of more than a third of all companies are characterized as cautious. Corporate branding strategists are advised to adopt conversational forms of corporate communication, to expand the range of SM used and to involve a broad range of stakeholders in the dialogue. This study adds to the limited body of academic research into the use of SM as part of corporate communication and corporate brand-building strategy."

Katherine Wertz

Coordinating constant invention: Social media's role in distributed work

Pigg, S. (2014). *Technical Communication Quarterly, 23,* 69–87. doi: 10.1080/10572252.2013.796545

"Cultural shifts in technology and organizational structure are affecting the embodied practice of symbolic-analytic work, creating the need for more fine-grained tracings of everyday activity. Drawing on interviews and observations, this article explores how one freelance professional communicator's social media use is intertwined with inventive social coordination. Networked writing environments help symbolic analysts gain access to communities of practice, maintain a presence within them, and leverage social norms to circulate texts through them."

Amber Fernald Rach

Driving employee engagement: The expanded role of internal communications

Mishra, K., Boynton, L., & Mishra, A. (2014). *International Journal of Business Communication, 51*, 183–202. doi: 10.1177/2329488414525399

"Increasingly, organizations and their public relations professionals are recognizing the importance of strengthening internal communication with employees. Internal communication is important for building a culture of transparency between management and employees, and it can engage employees in the organization's priorities. This exploratory study uses findings from interviews with public relations executives to explore the growing role that internal communication plays in employee engagement. Executives employ a variety of communication methods, including face-to-face communication, to communicate with employees. The executives'

chosen communication strategies aim to build trust and engagement with employees. In doing so, public relations executives find themselves in an expanded role of fostering employee engagement."

Katherine Wertz

Technical communication unbound: Knowledge work, social media, and emergent communicative practices

Ferro, T., & Zachry, M. (2014). *Technical Communication Quarterly, 23,* 6–21. doi: 10.1080/10572252.2014.850843

"This article explores the boundaries of technical communication as knowledge work in the emerging era of social media. Analyzing the results of an annual survey offered each year from 2008 until 2011, the study reports on how knowledge workers use publicly available online services to support their work. The study proposes a distinction between sites and services when studying social media in knowledge work and concludes with an exploration of implications for technical communication pedagogy."

Amber Fernald Rach

Using social media for collective knowledge-making: Technical communication between the Global North and South

Longo, B. (2014). *Technical Communication Quarterly, 23,* 22–34. doi: 10.1080/10572252.2014.850846

"This article examines changing social media practices, arguing that technical communicators and teachers understand their roles as mediators of information and communication technologies. Drawing on a case study growing out of a colloquium on technology diffusion and communication between the Global North and South, the author proposes that technical communicators be attentive to the participatory nature of social media while not assuming that social media replace the dynamics of face-to-face human interaction."

Amber Fernald Rach

Design

A comparative approach to enhance information interaction design of visual analytic systems

Qian, Z. C., Chen, Y. V., & Peng, Y. P. (2014). *Communication Design Quarterly, 2,* 28–33. [doi: none]

"This paper introduces a novel comparative strategy to access, synthesize, and redesign a mobile visual analytics (VA) system. Designing, evaluating, and improving VA tools are challenging because of the exploratory and unpredicted nature of their users' analysis activities in a real context. Often the system development approach is running rounds of iteration based on one or a few design ideas and related references. Inspired by ideation and design selection from design-thinking literature, [the authors] start to redesign systems from comparison and filtering based on a broad range of design ideas. This approach focuses on the information interaction design of systems; integrates design principles from information design, sensorial design, and interaction design as guidelines; compares VA systems at the component level; and seeks unique and adaptive design solutions. The Visual Analytics Benchmark Repository provides a rich collection of the Visual Analytics Science and Technology (VAST) challenges submission reports and videos. For each challenge design problem, there are multiple creative and mature design solutions. Based on this resource, [the authors] conducted a series of empirical user studies to understand the user experience by comparing different design solutions, enhanced one visual analytics system design, [the] MobileAnalymator, by synthesizing new features and removing redundant functions, and accessed the redesign outcomes with the same comparative approach."

Lyn Gattis

Improving icon design: Through focus on the role of individual symbols in the construction of meaning

Zender, M., & Mejía, G. M. (2013). *Visible Language, 47*(1), 66–89. [doi: none]

"Despite the fact that icons are widely relied upon for communication, designers have few principles to guide icon design. This paper reports a study of the role individual symbols play on the construction of meaning from icons. An experiment compared two sets of four icons, each made of a different set of discrete symbols. It finds that the interaction of the right number of symbols for the referent, and a more apt combination of individual symbols for the referent, can significantly improve the construction of an icon that communicates what was intended. The rules of thumb proposed here are applicable to construction of any visual communication that uses symbols."

Lyn Gattis

The influence of serifs on 'h' and 'i': Useful knowledge from design-led scientific research

Beier, S., & Dyson, M. C. (2014). *Visible Language, 47*(3), 74–95. [doi: none]

"The typographical naivety of much scientific legibility research has caused designers to question the value of the research and the results. Examining the reasons underlying this questioning, the paper discusses the importance of designers being more accepting of scientific findings, and why legibility investigations have value. To demonstrate how typographic knowledge can be incorporated into the design of studies to increase their validity, the paper reports on a new investigation into the role of serifs when viewed at a distance. The experiment looks into the identification of the lowercase letters 'j', 'i', 'l', 'b', 'h', 'n', 'u', and 'a' in isolation. All of the letters originate in the same typeface and are presented in one version with serifs and one version without serifs. Although the experiment found no overall legibility difference between the sans serif and the serif versions, the study showed that letters with serifs placed on the vertical extremes were more legible at a distance than the same letters in a sans serif. These findings can therefore

provide specific guidance on the design of individual letters and demonstrate the product of collaboration between designer and scientist on the planning, implementation, and analysis of the study."

Lyn Gattis

Investigating readers' impressions of typographic differentiation using repertory grids

Moys, J.-L. (2014). *Visible Language, 47*(3), 96–123. [doi: none]

"Document designers combine a range of stylistic and structural typographic attributes to articulate and differentiate information for readers. This paper explores how the kind of typographic differentiation used in a document influences readers' impressions of documents. A preliminary study indicated that three patterns of typographic differentiation (high, moderate and low) might underlie participants' impressions of magazine design. Subsequently, a set of nine magazine layouts with controlled content was purposefully developed to systematically examine the impact of high, moderate and low patterns of typographic differentiation on participants' impressions of documents. These documents were used in a repertory grid procedure to investigate the kinds of impressions readers articulate in relation to typographic presentation and whether readers are likely to formulate similar or differing impressions from high, moderate, and low patterns of typographic differentiation. The results suggest that typographic differentiation influences a range of rhetorical and experiential judgments. For example, participants described high differentiation documents as the most attention-grabbing and easy to skim-read, while they considered moderate and low differentiation documents to require deeper reading strategies. In addition, participants assumed high differentiation documents to be much more sensationalist than moderate or low differentiation documents, which they generally perceived as authoritative and credible."

Lyn Gattis

Letting context speak: The use of co-creative, design-led, and user-centered design methods in the design of complex public communications

Carlson, C., Peake, W., & Joiner, J. (2014). *Communication Design Quarterly, 2,* 34–39. [doi: none]

"This paper discusses how co-creative, design-led, and user-centered design methods are being utilized to gain insight into the factors that influence the communication of food recalls. It looks at the role of designer and public in these methods and considers the value of these methods for other settings."

Lyn Gattis

Education

The rhetoric of reach: Preparing students for technical communication in the age of social media

Verzosa Hurley, E., & Kimme Hea, A. C. (2014). *Technical Communication Quarterly, 23,* 55–68. doi: 10.1080/10572252.2014.850854

"The authors argue that technical communication instructors are in a particularly apt position to teach social media as key to students' lives as technical communicators and future professionals. Drawing on the concepts of *reach* and *crowd sourcing* as heuristics to rearticulate dominant cultural narratives of social media as deleterious to students' careers, the authors offer a case study of an introductory professional and technical communication pedagogy that helped to disrupt uncritical deployments of social media."

Amber Fernald Rach

Seeking an effective program to improve communication skills of non-English-speaking graduate engineering students: The case of a Korean engineering school

Kim, E. G., & Shin, A. (2014). *IEEE Transactions on Professional Communication, 57,* 41–55. doi: IEEE 10.1109/TPC.2014.2310784

"Many Asian universities have begun reforms to enhance educational competitiveness in our globalizing economy. This study aims to ascertain the status of English communication education and English-medium instruction at a Korean engineering school and to offer workable suggestions for English communication training for Korean graduate engineering students. . . . [The authors] collected data from documents as well as through surveys of faculty and students in graduate engineering programs . . . at the Korea Advanced Institute of Science and Technology. The results showed that students' English fluency is critical for the success of using English as a medium of instruction. To facilitate this fluency, universities need to establish an English communication center that provides a comprehensive, systematic approach to English language training. Faculty also need the services of such centers. It is also advised that a thesis writing course be customized according to students' actual writing and communication abilities and enhanced with collaboration between engineering faculty and English education faculty."

Lyn Gattis

A study on the revelations of design students' thinking styles in reflective journals

Venkatesh, A. (2013). *Visible Language, 47*(2), 1–36. [doi: none]

"Thinking, considered as part of the core skill set of a designer, is equally significant in learning and design processes. An awareness and understanding of a personal thinking style is therefore important for both teaching and learning. Using well-established theories of thinking and using an in depth multiple case method, the author explores the possibilities of exposing students' thinking styles through the medium of reflective journals. Eight journals are carefully examined in terms of where student attention is located, how they communicate and how they are thinking. A further aim is to provide a

guideline that can aid teachers to analyze the journals as feedback for the ease or difficulty associated with their teaching strategy. While the study is framed within a university design program, its findings may be of more general application."

Lyn Gattis

"That usability course": What technical communication programs get wrong about usability and how to fix it

Zhou, Q. (2014). *Communication Design Quarterly, 2,* 25–27. [doi: none]

"The approach to usability adopted by many technical communication programs often conceptually separates usability from other subject matter areas and places it at the tail-end of a project. Such an approach creates conceptual barriers with regard to how usability fits in a design project. As a result, students do not engage in the critical work of designing and testing iteratively in the formative phase of a product. We should broaden usability into user experience, enable students to see user experience as an iterative and agile process, and provide in-depth knowledge of user research methods."

Lyn Gattis

Tweeting an ethos: Emergency messaging, social media, and teaching technical communication

Bowdon, M. A. (2014). *Technical Communication Quarterly, 23,* 35–54. doi: 10.1080/10572252.2014.850853

"The expanding use of social media such as Twitter has raised the stakes for teaching our students about individual and organizational ethoi. This article considers the role of organizations' Twitter feeds during emergency situations, particularly Hurricane Irene in 2011, to argue for a pedagogical model for helping students collaboratively code tweets to assess their rhetorical effects and to improve their own awareness and use of microblogging as a communication tool."

Amber Fernald Rach

Ethics

Identical or just compatible? The utility of corporate identity values in communicating corporate social responsibility

Schmeltz, L. (2014). *International Journal of Business Communication, 51,* 234–258. doi: 10.1177/2329488414525439

"This study explores whether companies embracing a corporate social responsibility agenda have a strategic focus on adapting and aligning their value systems to reflect such commitment. The analysis is based on empirical data and a conceptual model juxtaposing corporate values, corporate social responsibility values, and implementation to capture how the different configurations of these aspects may impact the communication carried out by corporations. The findings indicate that the companies in the data sample operate with two markedly different value systems. The coexistence of two value systems is discussed in relation to the reported difficulties that companies experience when facing the new and complex challenge of communicating corporate social responsibility."

Katherine Wertz

Toward an ethical rhetoric of the digital scientific image: Learning from the era when science met Photoshop

Buehl, J. (2014). *Technical Communication Quarterly, 23,* 184–206. doi: 10.1080/10572252.2014.914783

"Over the past two decades, scientific editors have attempted to correct 'mistaken' assumptions about scientific images and to curb unethical image-manipulation practices. Reactions to the advent and abuse of image-adjustment software (such as Adobe Photoshop) reveal the complex relations among visual representations, scientific credibility, and epistemic rhetoric. Perelman and Olbrechts-Tyteca's model of argumentation provides a flexible system for understanding these relations and for teaching students to use scientific images ethically and effectively."

Amber Fernald Rach

Information management

Introduction to the CIDM study of user-generated content

Hackos, J. (2014). *Best Practices, 16,* 29, 32–38. [Center for Information-Development Management] [doi: none]

"User-generated content (UGC) has become increasingly important to corporations who want to take advantage of the knowledge that customers have about their products, particularly knowledge accumulated from actual field implementations. They believe that UGC will be beneficial to the entire customer base, as well as the internal product and information developers." Summarizing findings from a survey of 42 organizations, this article discusses how companies are incorporating UGC into information development, addressing obstacles to UGC initiatives, and developing best practices. Recommendations from the study include establishing clear goals for a UCG initiative, creating a business case that quantifies the benefits of UGC, choosing tools that facilitate collaboration and are easy to use, and providing incentives for potential contributors.

Lyn Gattis

Instructions

Craft and narrative in DIY instructions

Van Ittersum, D. (2014). *Technical Communication Quarterly, 23,* 227–246. doi: 10.1080/10572252.2013.798466

"This article examines tutorials from the Web site, Instructables.com, to highlight the rhetorical possibilities of including personal narratives in instructions. The narratives in these tutorials offer detailed accounts of their authors' experiences when constructing their projects, thereby functioning as accounts of the authors' craft knowledge. Pitched to amateur hobbyists, rather than the professional audiences of many forms of conventional technical communication, these tutorials offer new ways of teaching craft knowledge and techniques."

Amber Fernald Rach

Intercultural communication

Toward an understanding of Arabic persuasion: A Western perspective

Suchan, J. (2014). *International Journal of Business Communication, 51,* 279–303. doi: 10.1177/2329488414525401

"Despite the political and economic importance of Arabic-speaking countries in the Middle East and Northern Africa, limited published research exists about how Arabic culture and language shape regional communication practices, particularly persuasion. This research describes key characteristics of Arabic persuasion by reviewing the extant research and analyzing the persuasion dynamics between a U. S. organization and a Jordanian organization attempting to form a service partnership. Both the literature and results from the case study indicate that Arabic persuasion strategies differ in fundamental ways from U. S. and Western strategies. Various forms of repetition, highly metaphoric language, and strong emotion characterize Arabic persuasion norms when using Arabic and English. These norms are created by the linguistic characteristics of Classical Arabic, the close connection between the Arabic language and Islam, and the social and political hierarchies that shape Arabic interaction."

Katherine Wertz

Language

The Coffee Planter of Saint Domingo: A technical manual for the Caribbean slave owner

Ramey, J. W. (2014). *Technical Communication Quarterly, 23,* 141–159. doi: 10.1080/10572252.2013.811164

"In 1798, Laborie published a manual with detailed instructions for building a coffee plantation, for example, how to purchase and care for slaves, design plantation buildings, and maintain authority. Laborie's language is that behind the institution of slavery: Slaves are property and thus relate to economic

success. Through this review, [the author] investigate[s] historical technical documents to see how our past informs our present and how our attention to technical communication today can inform the future."

Amber Fernald Rach

Management

The dialectical nature of impression management in knowledge work: Unpacking tensions in media use between managers and subordinates

Erhardt, N., & Gibbs, J. L. (2014). *Management Communication Quarterly, 28,* 155–186. doi: 10.1177/0893318913520508

"The stage on which impressions are managed is no longer purely a physical one but is increasingly mediated by various communication technologies that offer different affordances. This study examines the interplay of media affordances, impression management, and dialectical tensions in relationships between managers and their subordinates. Based on 91 semi-structured interviews and observations from six project teams operating in the consumer health, insurance, and engineering industries located in Sweden and the United States, [the authors] identify and explore three sets of impression management tactics. [The] analysis reveals that the actions of managers and subordinates were often in dialectical tension, playing out through multiple media in a tactic–countertactic dynamic that played an important role in shaping manager–subordinate relationships. [The authors] discuss how these tactics complement and extend theory on impression management, dialectical tensions, and media use in organizations."

Lyn Gattis

How nonemployer firms stage-manage ad hoc collaboration: An activity theory analysis

Spinuzzi, C. (2014). *Technical Communication Quarterly, 23,* 88–114. doi: 10.1080/10572252.2013.797334

"Nonemployer firms—firms with no employees—present themselves as larger, more stable firms to take on clients' projects. They then achieve these projects by recruiting subcontractors, guiding subcontractors' interactions with clients, and coordinating subcontractors to protect their team performance for the client. Using fourth-generation activity theory, [the author] examine[s] how these firms stage-manage their ad hoc collaborations. [The author] conclude[s] by describing the implications for further developing fourth-generation activity theory to study such instances of knowledge work."

Amber Fernald Rach

Strategic internal communication: Transformational leadership, communication channels, and employee satisfaction

Men, L. R. (2014). *Management Communication Quarterly, 28,* 264–284. doi: 10.1177/0893318914524536

"The current study investigates how leadership influences internal public relations by building the linkage between transformational leadership, the use of communication channels, symmetrical communication, and employee satisfaction. Furthermore, it examines the effectiveness of various internal communication channels. Through a web survey of 400 employees working in medium-sized and large corporations in the United States, the study showed that transformational leadership positively influences the organization's symmetrical internal communication and employee relational satisfaction. Transformational leaders most often use information-rich face-to-face channels to communicate with followers. Leaders' use of face-to-face channels is positively associated with employee satisfaction. Employees mostly prefer emails to receive information from the organization regarding new decisions, policies, events, or changes, followed by general employee meetings and interpersonal communication with managers. Theoretical and practical implications are discussed."

Lyn Gattis

What makes performance feedback seem just? Synchronicity, channel, and valence effects on perceptions of organizational justice in feedback delivery

"Because organizations may increasingly utilize a variety of different methods to communicate with employees both on- and off-site, performance feedback may not continue to be bound to traditional face-to-face interaction. Knowing how channel and synchronicity may affect perceptions of feedback may be very useful to organizations and supervisors as the use of alternative work arrangements increases. This study was conducted to learn more about the delivery of performance feedback to employees and what would cause them to feel justly versus unjustly treated by their supervisors. Synchronicity, channel, and valence effects on perceptions of justice in feedback delivery were examined through a fully crossed 2 × 2 × 2 design of 447 participants. Findings suggest that positive feedback and delivery via phone call rather than text message were associated with higher perceptions of organizational justice. Practical implications for organizations are also addressed."

Lyn Gattis

Public relations

Genres and processes in the PR industry: Behind the scenes with an intern writer

"This article examines the processes involved in the production and pitching of press releases and considers the demands that these make on PR practitioners, particularly newcomers to the industry. The study tracks the course of events as a PR company undertook a promotional brief, using as its central source of data a daily journal written by an intern who was closely involved in the process. Three pivotal cycles of activity, each constructed by means of a cluster of satellite genres and activities, contributed to the overall process: brainstorming, writing the press release itself, and media-pitching. The findings show the ways in which the goals of the PR organization under study were achieved by means of a complex, dynamic, collaboratively constructed, and intertextually linked genre system. It is suggested that becoming a successful PR practitioner involves learning how to manage an interconnected process that is constantly evolving, and how to rework and repackage information for different audiences."

Katherine Wertz

Research

Designing a questionnaire to gather carer input to pain assessment for hospitalized people with dementia

"[The authors] describe development of a questionnaire to elicit pain symptoms and experience, for use by people with dementia or their carers, at hospital admission. The questionnaire provided contextual information to support professionals' use of the Abbey Pain Scale, a validated tool used by nursing staff internationally. Appropriate information and physical design were required in order, not only to create an approachable questionnaire for patients and carers, but also to ensure fit with hospital processes. Fit with hospital process had significant influence on the final form of the questionnaire, compromising some aspects of design for patients and carers, but this compromise was considered essential to ensure pain management procedures were supplemented by wider, contextual information."

Lyn Gattis

Impact of journals and academic reputations of authors: A structured bibliometric survey of the IEEE publication galaxy

Canavero, F., Franceschini, F., Maisano, D., & Mastrogiacomo, L. (2014). *IEEE Transactions on Professional Communication, 57,* 17–40. doi: IEEE 10.1109/TPC.2013.2255935

"This study explores the use of bibliometric indicators to objectively evaluate IEEE scientific journals from two different perspectives: (1) journal impact and diffusion and (2) the academic reputation of journal authors. . . . This quantitative study performed citation analysis on 250,000 authors in 110 IEEE journals using citation statistics from the Google Scholar, Web of Science, and Scopus databases to construct the spectrum indicator. The authors used automated filtering techniques to exclude questionable author data. . . . Maps were constructed to locate journals graphically based on the complementary indicators of impact and reputation, and to show changes in impact and reputation over time. The maps indicated that journals with high impact tend to have authors with high reputations but the opposite is not necessarily true. Suggestions were made to explain different combinations of high and low impact and reputation for journals. . . . Future research could examine non-IEEE journals and normalize subfields within IEEE journals to avoid favoring fields that use more citations."

Lyn Gattis

Interactivity of corporate websites: An integrative review of the literature

Zollet, R. (2014). *IEEE Transactions on Professional Communication, 57, 2*–16. doi: IEEE 10.1109/TPC.2014.2305795

This study explores the evolution of research on interactivity in corporate Web sites and categorizes existing research. The author qualitatively analyzed 166 articles on corporate Web site interactivity, classifying "relevant contributions by research issue and category. . . . Among the identified research issues concerning interactivity that facilitates communication of the organization, only relationship management emerged as a dominant issue. Research issues concerning interactivity that facilitates e-commerce could be found most and they tend to focus on two main areas: decision support systems and recommendation agents on sales-oriented e-commerce websites and loyalty, satisfaction, and trust as key variables. Research issues concerning interactivity for interpersonal communication mainly focus on the user's individual motivation and successive behavior, and contain many different references to computer-mediated interaction and online communities. Research issues in the field of designing for interactivity discuss interface design questions and focus on numerous website characteristics and their impact." The author recommends that future research "explore the organizational behavior related to innovation diffusion on corporate websites."

Lyn Gattis

Reflections on teaching research: A conversation with Meredith Davis, Mary Dyson, Judith Gregory

Poggenpohl, S. (2013). *Visible Language, 47*(1), 12–37. [doi: none]

"As research in design is gaining traction in university programs, understanding approaches to teaching research skills, the value of a research approach in design and even fundamentally reflecting on what research is becomes germane. Like varieties of design practice, there are many varieties of research process and methods to address different research questions, and certainly different programs have different goals for their students at various levels of education. Three faculty teaching in university design programs with years of experience guiding research projects, reflect on their experience, offering different perspectives on this emerging topic. "

Lyn Gattis

Scientific communication

Communicating complexity in transdisciplinary science teams for policy: Applied stasis theory for organizing and assembling collaboration

Shea, M., & Mozafari, C. (2014). *Communication Design Quarterly, 2,* 20–24. [doi: none]

"This paper presents an application of stasis theory for the purpose of consulting with interdisciplinary teams of scientists working in the early stages of composing a science policy advisory document. By showing that stasis theory can be used as an organizing conceptual tool, [the authors] demonstrate how cooperative and organized question-asking practices calm complex interdisciplinary scientific disputations in order to propel productive science policy work. [The authors] believe that the conceptual structure of stasis theory motivates scientists to shift their viewpoints from solitary expert specialists toward that of allied policy guides for their advisory document's reader. [The authors] further argue that, through the use of stasis theory, technical writers can aid interdisciplinary scientists in policy writing processes, thus fostering transdisciplinary collaboration."

Lyn Gattis

Harms of hedging in scientific discourse: Andrew Wakefield and the origins of the autism vaccine controversy

Kolodziejski, L. R. (2014). *Technical Communication Quarterly, 23,* 165–183. doi: 10.1080/10572252.2013.816487

"This study reveals the discursive origins of the Autism MMR vaccine controversy through a rhetorical examination of the 1998 Wakefield et al. article. [The author] argue[s] the very practices of scientific publishing, specifically the tradition of hedging, help to create a scientifically acceptable text but also leave discursive gaps. These gaps allow for alternate interpretations as scientific texts pass from technical to public contexts, enabling insufficiently supported claims the standing of scientific knowledge among citizens."

Amber Fernald Rach

Mirror neurons in a group analysis "Hall of Mirrors": Translation as a rhetorical approach to neurodisciplinary writing

Gruber, D. R. (2014). *Technical Communication Quarterly, 23,* 207–226. doi: 10.1080/10572252.2013.816489

"This article examines how mirror neuron research from the neurosciences is incorporated by the field of group analysis and made to fit within the history and practices of the field. The approach taken is from science and technology studies' discussion of 'translation' across actor-networks. The article ends with the suggestion that a translation analysis indicates good reason for rhetoric and writing scholars to consider 'multiple ontologies' and to understand neurodisciplinary work as invention."

Amber Fernald Rach

Usability

Analyzing card-sorting data using graph visualization

Paul, C. L. (2014). *Journal of Usability Studies, 9,* 87–104. [doi: none]

"This paper describes a method for visualizing and analyzing co-occurrence in card-sorting data. Card sorting is a popular knowledge elicitation method used in information architecture and user experience design. However, analyzing card-sorting data can be a challenge. Detailed qualitative analysis is difficult and time consuming, especially for larger studies. Quantitative analysis can be automated and is scalable, but can be difficult to interpret. A graph visualization offers a novel way to analyze and understand the relationships between cards and the mental models elicited in a card-sorting study. Graph visualizations are graphs that illustrate connections between concepts, such as cards in a card-sorting study. A visualization can quickly show relationships between cards and clusters of cards that represent topics that may not be obvious from traditional card-sort analysis methods. A case study describes how graph visualization can be used to analyze the data. The results of the analysis are compared and contrasted with a popular histogram-matrix analysis

method. Strengths and weaknesses of the proposed graph-visualization analysis method are discussed."

Lyn Gattis

The pervasiveness of text advertising blindness

Owens, J. W., Palmer, E. M., & Chaparro, B. S. (2014). *Journal of Usability Studies, 9,* 51–69. [doi: none]

"Users of websites tend to ignore text advertisements, especially when they are on the right side of a web page, even when the advertisements are useful for completing a task. This study explores the impact of web page layout conventions on text advertising blindness and how quickly users adapt to websites that violate layout conventions. Participants performed search tasks on either 'standard' or 'nonstandard' website layouts. In the nonstandard website, content from the left (i.e., navigation menu) and the right side of the website (i.e., text advertisements) were reversed. Results demonstrated that text advertising blindness was prevalent regardless of the website layout. Users adapted to the reversed layout rapidly, but at a cost of perceived mental effort and task success. Analyses of eye movement data showed that users had a tendency to fixate first in the standard location for the navigation menu when using the nonstandard website, but did not fixate more often in that location after the first few trials. A decrease in text ad blindness over time for the standard, but not the nonstandard, website design also was observed. Practitioners are advised not to violate web layout norms in an attempt to draw more attention to web advertisements. This strategy may be counterproductive where it may actually increase text advertising blindness and decrease the usability of the website."

Lyn Gattis

Set of guidelines for persuasive interfaces: Organization and validation of the criteria

Némery, A., & Brangier, E. (2014). *Journal of Usability Studies, 9,* 105–128. [doi: none]

"This study presents an attempt to organize and validate a set of guidelines to assess the persuasive characteristics of interfaces (web, software, etc.). Persuasive aspects of interfaces are a fast growing topic of interest; numerous website and application designers have understood the importance of using interfaces to persuade and even to change users' attitudes and behaviors. However, research has so far been limited by a lack of available tools to measure interface persuasion. This paper provides a criteria-based approach to identify and assess the persuasive power of interfaces. [The authors] selected 164 publications in the field of persuasive technology, and . . . used those publications to define eight criteria: credibility, privacy, personalization, attractiveness, solicitation, priming, commitment, and ascendency. Thirty experts in human-computer interaction (HCI) were asked to use guidelines to identify and classify persuasive elements of 15 interfaces. The average percentage of correct identification was 78.8%, with Randolph's kappa coefficient = 0.61. These results confirm that the criteria for interactive persuasion, in their current form, can be considered as valid, reliable, and usable. This paper provides some inherent limitations of this method and identifies potential refinements of some definitions. Finally, this paper demonstrates how a checklist can be used to inspect the persuasiveness of interfaces."

Lyn Gattis

User experience and accessibility: An analysis of county web portals

Youngblood, N. E., & Youngblood, S. A. (2013). *Journal of Usability Studies, 9,* 25–41. [doi: none]

"Website usability reinforces trust in e-government, but at the local level, e-government tends to have usability and accessibility problems. Web portals should be usable, accessible, well coded, and mobile-device-ready. This study applies usability heuristics and automated analyses to assess a state-wide population of county web portals and examines whether population, per capita income, or median household income are related to

usability, accessibility, and coding practices. To assess usability, [the authors] applied a 14-point usability heuristic to each site's homepage. To study accessibility and coding, [the authors] examined each homepage with an accessibility checker and with the World Wide Web Consortium's (W3C) HTML validator. [The authors] also examined the HTML and Cascading Style Sheets (CSS) of each site to check for mobile-device readiness and to better understand coding problems the automated tools identified. This study found that portal adoption is associated with each of the demographics above and that accessibility has a weak inverse relationship to per-capita income. Many of the sites [the authors] examined met some basic usability standards, but few met all the standards used, and most sites did not pass a basic accessibility analysis. About 58% of the counties [the authors] examined used a centralized county web portal (not including county commission sites), which is better than a 2006 study that found a 56% portal adoption at the national level. Resulting recommendations include best-practice suggestions for design and for using automated tools to identify problems, as well as a call to usability professionals to aid in county web portal development."

Lyn Gattis

Writing

The naked truth about the naked this: Investigating grammatical prescriptivism in technical communication

Boettger, R. K., & Wulff, S. (2014). *Technical Communication Quarterly, 23,* 115–140. doi: 10.1080/10572252.2013.803919

"The decision to follow the demonstrative *this* with a noun phrase is important to students' writing development. Previous research has emphasized when students should not attend *this* rather than studying why students make the choice. Using a corpus-linguistic approach, we investigated 1,999 instances of (un)attended *this* in student technical and academic writing. High shares of unattended *this* were found in both text types as well as in original and revised drafts."

Amber Fernald Rach